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TRANSPORTATION



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Transportation Sector

Certification Specifics REPORT

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TRANSPORTATION SECTOR COORDINATORS' REPORT

AGENCY STATEMENT

The number one priority of the Workplace Health and Safety Agency (also known as the Agency, or WHSA) is to develop a training program that will allow certified members of Joint Health and Safety Committees in Ontario to perform effectively under the Occupational Health and Safety Act.

CERTIFICATION PROGRAM

Under 1990 amendments to the Occupational Health and Safety Act (Bill 208), the Workplace Health and Safety Agency was established with a broad mandate to deal with health and safety issues in the workplace. Some of these include research, funding of delivery organizations, promoting public awareness and certifying persons to act in the capacity of the Certified Members on Joint Health and Safety Committees (JHSCs) in Ontario.

The Agency's first priority is the Certification Training Program that will assist certified persons on JHSCs in Ontario to perform effectively under the OH&S Act.

In October 1991, the Agency Board of Directors agreed on a basic design for the Certification Program. A Core training component of the program would apply to all workplaces requiring a committee, regardless of the type of workplace. In addition, a Specifics component would be developed to apply to a particular type of workplace.

In March 1992, sixteen bipartite Labour and Management representatives produced a consensus content document. This material defined the body of knowledge (about health and safety), from which the Core Training Program would be written and subsequently launched on April 5, 1993.

On October 27, 1993, development of the Specifics component was initiated by bringing together 40 Labour and Management representatives from 20 different sectors. They set about the tasks of jointly identifying employers in their respective sectors, contacting them by phone and distributing Hazard Information Surveys to about 1800 Joint Health and Safety Committees across the province. Where required or requested, they were provided in French, as well.

This gave the workplace parties, both workers and managers, an opportunity to provide direct input into the process by jointly identifying hazards, control measures and available training programs in the workplace. Their responses provided invaluable information for the drafting of this document. The bipartite agreements and willingness to participate in this project demonstrates a breakthrough in health and safety cooperation in Ontario.

The Core Certification Training Program has been designed to provide a working knowledge of health and safety issues, regardless of the industry in which the certified person is employed.

The Certification Specifics Training Program will build upon that knowledge and provide additional training that is more reflective of the actual hazards of a particular industry or sector.

OBJECTIVES OF THE CERTIFICATION SPECIFICS PROJECT

P R O J E C T O B J E C T I V E S

Certification Specific Programs will form the final component of the requirements for certification of Joint Health and Safety Committee members (after completion of Core Certification training and submission of a Health and Safety Analysis and Workplan). Developed with equal input from Labour and Management at the sector level, Certification Specifics will provide the designated members with the knowledge and skills to properly identify and control hazards specific to their industry or sector.

The primary objectives of the Certification Specifics Project are:

- To develop quality training materials that equip certified health and safety committee members to improve worker well being through making of recommendations for the establishment of safe work procedures for specific work processes;
- To involve workplace parties in the development of materials, thereby insuring both input on specific work processes and their hazards, and commitment to the delivery of these materials;
- To effectively coordinate the development of training materials so that any duplication of the process is eliminated, and;
- To develop a bipartite process in which consensus is achieved through shared responsibility and mutual respect between labour and management representatives.

THE CERTIFICATION PROCESS

The purpose of this form is to provide a clear and concise overview of the certification process for the Transportation Sector. This process is designed to ensure that all individuals seeking certification are evaluated fairly and consistently, and that the resulting certification is a reliable indicator of their skills and knowledge.

The process begins with the individual completing a self-assessment, which identifies their current level of proficiency and the specific areas in which they need to improve. This is followed by a series of training and development activities, which may include classroom instruction, on-the-job training, and self-study. The individual then undergoes a rigorous evaluation process, which typically consists of a written exam, a practical skills assessment, and a final oral exam. If the individual successfully completes all three components, they are awarded certification.

It is important to note that certification is not a one-time event. Individuals are required to maintain their certification by participating in ongoing education and training activities. This ensures that they remain up-to-date on the latest industry practices and technologies. Additionally, the certification process is subject to periodic review and revision, as the industry evolves and new challenges arise.

The Transportation Sector Certification Program is a valuable tool for individuals seeking to advance their careers and for employers seeking to ensure the highest quality of their workforce. By participating in this program, individuals can demonstrate their commitment to excellence and their ability to meet the demands of the industry. Employers can benefit from the program by ensuring that their employees are equipped with the skills and knowledge necessary to perform their jobs effectively and safely.

AGENCY OBJECTIVES FOR THE CERTIFICATION SPECIFIC PROGRAMS

AGENCY OBJECTIVES

- To build upon the knowledge acquired in the Core Program and provide training that is specifically about the hazards found at a participant's place of work;
- To provide training materials and the opportunity for learning about the recognition, assessment, control or elimination of hazards as they apply to a participant's place of work; as opposed to skills training for safe job performance;
- To assure that the Specifics Programs will be structured in a manner that allows flexibility and input of new information over time, as needs change, with regard to workplace hazards and training of Certified Members of Joint Health and Safety Committees in Ontario.

SECTOR REPORT

PURPOSE

This report is intended to provide the results of the needs analysis process conducted in the Transportation Sector. The report will focus on the hazards in the respective industries in the sector. The report will also provide consensus recommendations regarding training programs that best address the hazards in each sub-sector.

You will find in this report the results of surveys that were sent out for completion to various workplaces in the Transportation Sector. Also included will be lists of pertinent research, data collected from other sources and constituents feedback. Training needs identified through literature and statistical searches will also be included.

An analysis of the findings will be compiled, and the report will conclude with our recommendations for module development in this sector.

SUB-SECTOR CONFIGURATION

The Transportation Sector is a vast and geographically diverse group of **industries**. Many different types of industries are found in this sector. In determining a Sector configuration several tools were used.

WORKERS COMPENSATION BOARD CLASSIFICATION SCHEME

The pre 1992 and 1993 Workers Compensation Board (W.C.B.) rates were used. W.C.B.'s classification scheme divides employer operations into industry classes. Pertinent industry classes include Class D - Manufacturing, Class E - Transportation and Storage and Class F - Retail and Wholesale Trades. In Table 1 these classes are broken down into rate groups that fall under coverage in the Transportation Sector. In categorizing employers, the W.C.B. bases their decision on the employers description of their business activities, business contracts, direct competitors, equipment used, on site inspections and staff duties.

Table 1 - On Rate Groups

Class	Old Rate	New Rate	Description
D Manufacturing	692	497	Ready-Mix Concrete Industry
E Transportation & Storage	674	551	Air Transport Industries
E Transportation & Storage	674	553	Air Transport Services
E Transportation & Storage	665	560	Warehouse Industry
E Transportation & Storage	656	570	General Trucking
E Transportation & Storage	656	577	Courier Service Industry
E Transportation & Storage		580	Bus, Rail & Water Transport Industries
E Transportation & Storage	709	582	Cargo Handling
E Transportation & Storage	709	584	School Bus Operations
E Transportation & Storage	709	586	Taxicab & Limousine Service
E Transportation & Storage	692	590	Ambulance Service*
F Retail & Wholesale Trade	692	681	Lumber & Builder's Supplies
F Retail & Wholesale Trade	717 & 726	689	Waste Materials (Recycling)

* Now under the Coordinating efforts of the Health Care Sector

STANDARD INDUSTRIAL CLASSIFICATIONS (1980)

In determining the industries that fall under the Transportation Sector, we have relied on the Standard Industrial Classification (1980) Codes - (S.I.C.). The Ministry of Labour uses this system to help identify and classify workplaces in this Province under their jurisdiction. Below in Table 2 is a list of all the industries and their corresponding S.I.C. (1980) codes found in this sector.

Table 2 - Ministry of Labour 1980 SIC Codes for Industries within the Transportation Sector

35	Major Group 35: Non-Metallic Mineral Products Industries
355	Ready Mix Concrete Industry
3551	Ready Mix Concrete Industry
45	Major Group 45: Transportation Industries
451	Scheduled Air Transport Industries
4511	Scheduled Air Transport Industries
4512	Non-Scheduled Air Transport, Chartered, Industry
4513	Non-Scheduled Air Transport, Specialty, Industry
452	Service Industries Incidental to Air Transport
4521	Airport Operations Industry
4522	Aircraft Rental Industry
4523	Aircraft Servicing Industry
4529	Other Service Industries Incidental to Air Transport
453	Railway Transport and Related Service Industries
4531	Railway Transport Industry
4532	Service Industry Incidental to Railway Transport
454	Water Transport Industries
4541	Freight and Passenger Water Transport Industry
4542	Ferry Industry
4543	Marine Towing Industry
4544	Ship Chartering Industry
4549	Other Water Transport Industries
455	Service Industries Incidental to Water Transport
4551	Marine Cargo Handling Industry

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4552	Harbour and Port Operation Industry
4553	Marine Salvage Industry
4554	Piloting Service, Water Transport Industry
4555	Marine Shipping Agencies Industry
4559	Other Service Industries Incidental to Water Transport
456	Truck Transport Industries
4561	General Freight Trucking Industry
4562	Used Goods Moving and Storage Industry
4563	Bulk Liquids Trucking Industry
4564	Dry Bulk Materials Trucking Industry
4565	Forest Products Trucking Industry
4569	Other Truck Transport Industries
457	Public Passenger Transit System Industries
4571	Urban Transit Systems Industry
4572	Interurban and Rural Transit Systems Industry
4573	School Bus Operations Industry
4574	Charter and Sightseeing Bus Services Industry
4575	Limousine Service to Airports and Stations Industry
458	Other Transportation Industries
4581	Taxicab Industry
4589	Other Transportation Industries n.e.c.
459	Other Service Industries Incidental to Transportation
4591	Highway, Street and Bridge Maintenance Industry
4592	Freight Forwarding Industry
4599	Other Service Industries Incidental to Transportation n.e.c.
47	Major Group 47: Storage and Warehousing Industries
4791	Refrigerated Warehousing Industry
4799	Other Storage and Warehousing Industries n.e.c.
48	Major Group 48: Communication Industries
484	Postal and Courier Service Industries
4841	Postal Service Industry
4842	Courier Service Industry
59	Major Group 59: Other Products Industries, Wholesale
591	Waste Materials, Wholesale
5911	Automobile Wrecking
5919	Other Waste Materials, Wholesale

NATIONAL OCCUPATIONAL CLASSIFICATION

The National Occupational Classification (N.O.C.) is a classification by occupation of the Canadian labour market. The N.O.C.'s are different than the industry classification S.I.C.'s as referred to previously. The N.O.C.'s show that many occupations are usually found within a particular industry. In cross referencing the N.O.C.'s with the S.I.C.'s, it has enabled the authors of this report the opportunity to understand the different occupations that exist in each of the transportation sector industries. This understanding has facilitated our efforts in achieving Certification Specific training recommendations. See Table 3 listed below with the Current Transportation Sector, Sub-sectors accompanied by the main product/service industries and corresponding N.O.C. occupational groups.

Table 3 - National, Occupational Classifications and Main Product/Service Industries Found in the Transportation Sector

Industry	N.O.C.
<u>Air Transport Industry 551</u>	
• Scheduled Air Transport Industry	2271 Air Pilots, Flight Engineers and Flying Instructors
• Non Scheduled Air Transport Charter Industry	2262 Engineering Inspectors and Regulatory Officers (Airworthiness Inspectors)
• Non Scheduled Air Transport Specialty Industry	6432 Pursers and Flight Attendants
<u>Airport Services 553</u>	
• Airport Operations Industry	0721 Facility, Operations Managers (Airport Manager)
• Private Airport Operation Industry	1476 Transportation Route and Crew Schedulers
• Aircraft Rental Industry	2272 Air Traffic Control Occupations
• Aircraft Servicing Industry	7437 Air Transport, Ramp Attendants
• Other Service Industries Incident to Air Transportation	6433 Airline Sales and Service Agents (could be grouped as Cargo Handlers)
	6651 Security Guards and Related Occupations
	7315 Aircraft Mechanics and Aircraft Inspectors

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Industry	N.O.C.
<u>Bus, Rail and Water Transport Industries 580</u>	
• Railway Transport Industry	0713 Transportation Managers
• Service Industry Incidental to Railway Transport	0721 Facility Operations Manager
• Passenger and Freight Water Transport Industry	1236 Customs, Ship and Other Brokers
• Ferry Industry	1476 Transportation Route and Crew Schedules
• Marine Towing Industry	2273 Deck Officers, Water Transport
• Towing Logs Industry	2274 Engineer Officers, Water Transport
• Ship Chartering Industry	2275 Railway and Marine Traffic Controllers
• Other Water Transport Industries	6434 Ticket and Cargo Agents and Related Clerks (except Airlines)
• Harbour and Port Operations Industry	6441 Tour and Travel Guides (Accompany Groups)
• Marine Salvage Industry	6672 Other Attendants in Accommodation and Travel (except Airline Travel)
• Piloting Service, Water Transport Industry	7221 Supervisors, Railway Transport Operations
• Other Service Industries Incidental to Water Transport	7222 Supervisors Motor Transport and Other Ground Transport Operations
• Cleaning of Ship's Holds, Tanks etc.	7314 Railway Crewmen/Women
• Urban Transit System Industry	7361 Railway and Yard Locomotive Engineers
• Bus Service	7362 Railway Conductors and Brakemen/Women
• Interurban and Rural Transit Systems Industry	7431 Railway Track Maintenance Workers
• Charter Tour and Sight Seeing Bus Services	7433 Deck Crew, Water Transport
	7434 Engine Room Crew, Water Transport
	7435 Lock and Cable Ferry Operators and Related Occupations
	7436 Boat Operations
	7412 Bus Drivers, Subway Operators and Other Operators
	7622 Railway and Motor Transport Labourers

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Industry	N.O.C.
<u>Cargo Handling 582</u> <ul style="list-style-type: none"> • Marine Cargo Handling Industry • Other Loading/Unloading Services 	<ul style="list-style-type: none"> • OSC 147 Shippers and Receivers
<u>Courier Service Industry 577</u> <ul style="list-style-type: none"> • Rural Mail Delivery (Contractor) • Postal Service Industry • Courier Service Industry 	1461 Mail, Postal and Related Clerks 1462 Letter Carriers 1463 Couriers and Messengers
<u>General Trucking 570</u> <ul style="list-style-type: none"> • General Freight Trucking Industry • Used Goods Moving and Storage Industry • Bulk Liquids Trucking Industry • Dry Bulk Materials Trucking Industry • Forest Products Trucking Industry • Other Truck Transport Industries • Highway, Street and Bridge Maintenance Industry • Operation of Bridges • Freight Forwarders (Trucking) • Other Service Industries Incidental to Transportation • Supply of Drivers and Helpers • Waste Management Services • Radio Active Recover/Disposal Services • Chemical Waste Recover/Disposal Services • Other Liquid Waste Recovery/Disposal Services • Towing Services 	0713 Transportation Managers 1475 Dispatchers and Radio Operators 1476 Transportation Route and Crew Schedulers 6434 Ticket and Cargo Agents and Related Clerks (except Airline) 6465 By-Law Enforcement and Other Regulatory Officers Not Otherwise Classified (Commercial Transportation Inspector) 7222 Supervisors, Motor Transport and Other Ground Transit Operators 7321 Motor Vehicle Mechanics, Technicians and Mechanical Repairers 7411 Truck Drivers 7414 Delivery Drivers 7422 Public Works Maintenance Equipment Operators 7621 Public Workers and Maintenance Labourers 7622 Railway and Motor Transport Labourers
<u>Ready-Mix Concrete Industry 497</u> <ul style="list-style-type: none"> • Nil 	7411 Truck Drivers

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Industry	N.O.C.
<u>School Bus Operator 584</u> <ul style="list-style-type: none"> • Nil 	0713 Transportation Manager 7222 Supervisors, Motor Transport and Other Ground Transit Operators 7412 Bus Drivers, Subway Operators and Other Transit Operators
<u>Taxicabs and Limousine Services 586</u> <ul style="list-style-type: none"> • Limousine Service • Taxicab Industry • Dispatching Services • Other Transportation Industries Not Otherwise Classified 	Nil
<u>Warehousing Industry 560</u> <ul style="list-style-type: none"> • Freight Forwarding (Warehousing) • Refrigerated Warehousing Industry • Other Storage and Warehousing Not Elsewhere Classified 	1471 Shippers and Receivers 7452 Material Handlers
<u>Waste Materials (Recycling) 689</u> <ul style="list-style-type: none"> • Automobile Wrecking • Other Waste Materials Recycling (excluding Metal) • Metal Waste Recycling (excluding Auto) 	7411 Truck Drivers
<u>Lumber and Builder's Supply Service 681</u> <ul style="list-style-type: none"> • Lumber, Plywood and Millwork • Self Serve Retail Building Supplies • Other Building Materials • Forest Products, Wholesale 	6421 Retail Salespersons and Sales Clerks 9513 Woodworking Machine Operators

The only deletion we made to this sector from the original sector/sub-sector list (based on the W.C.B. rate group structure) was to give rate group 590, Ambulances to the health Care Sector. In a consensus agreement between both coordinators our rationale was based on the most prevalent hazards that the workers in this rate group faced. Also of note is the fact that ambulance attendants would fall under the Health Care Regulations.

As well some of the firms that originally fell under schedule 2 of the Workers Compensation Act such as some public transit companies have been added to this sector.

Listed in Table 4 is a tabulation of information that was wrested from a list of large firms - by rate group - based on W.C.B. data extracted March, 1993 from Class 29 - Transportation. We supplemented this list with information provided by the Ministry of Labour Office of Collective Bargaining Information as of November 19, 1993. As mentioned several times in this report, one of the biggest challenges in developing a profile of the Transportation Sector was in segregating Federally and Provincially Regulated companies. Neither of these documents facilitated that task completely and we relied on information provided by constituents familiar to the sector and in conversations with Labour Canada Inspectors familiar with jurisdictional definitions.

DETAILS OF INFORMATION ON TABLE 4

- (1) Information is based on a list of large firms by rate group based on W.C.B. data extracted March 1993 - Class 29 Transportation.
- (2) All companies listed in this rate group are under Federal Jurisdiction and fall under Part II of the Canada Labour Code for Health and Safety Legislation.
- (3) Includes Brewers Retail Inc. which may be part of the Retail Sector.
- (4) Excludes Brewers Retail Inc.
- (5) Some of the companies listed in this source document are under Part II of the Canada Labour Code and fall under Federal Health and Safety Legislation.
- (6) Excludes many transit companies such as Toronto Transit Commission which fall under Schedule 2 of the W.C. Act.
- (7) The source document did not include such firms as Laidlaw Transit which has many branches in Ontario under Provincial Health and Safety Legislation.
- (8) This sub-sector is now being coordinated in the Health Care Sector.
- (9) Firms with more than one branch are only counted as having one committee. These numbers will be substantially higher.
- (10) Includes transit and school bus companies known to be under Provincial Health and Safety Legislation. The information was extracted from M.O.L. office of collective bargaining information as of November 19, 1993.

In summary, we have condensed this information to provide a clear understanding of the Transportation Sector. It is with this understanding of the Transportation Sector that we were able to proceed with the next phase of our project, the Needs Analysis Process.

Table 4 - Sector Profile

No. of Committees (1) & (9)	No. of Workers (1)	No. of Firms (1)	Description	Rate Group
17	3758	17	Ready-Mix Concrete Industry	497
25	3060	25	Air Transport Industries (2)	551
10	1647	10	Air Transport Services (2)	553
37 (4) 38 (3)	3044 (4) 8888 (3)	37 (4) 38 (3)	Warehouse Industry	560
162	12,500	162	General Trucking (5)	570
14	1514	14	Courier Service Industry (2)	577
34	6790	34	Bus, Rail & Water (5) Transport (6) Industries	580
5	282	5	Cargo Handling (2)	582
59	7107	59	School Bus Operations (5) (7)	584
18	1265	18	Taxicab & Limousine Service	586
33	4358	33	Ambulance Service (8)	590
171	9129	171	Lumber & Builder's Supplies	681
37	1752	37	Waste Materials (Recycling)	689
623	62050	623	Total Including (2)'s & (8)	
536	51189	536	Total Excluding (2)'s & (8)	
574	63515	574	Includes (10)	

JOINT HEALTH AND SAFETY COMMITTEE (J.H.S.C.) INVOLVEMENT BY CONTRIBUTING DATA

The mandate for Certification Specifics program development in the Transportation Sector was to receive input from as many constituents as possible. One way to achieve this was through conducting a needs analysis. J.H.S.C. were selected to participate in an extensive needs analysis which has helped determine the content and priorities for this sector.

A Workplace Hazard Information Survey was developed in a bipartite environment with input from sector coordinators representing Labour and Management. Additional support was added by the many constituents that both Coordinators utilized throughout the analysis.

The information requested was extensive. J.H.S.C.'s were asked to provide detailed lists of actual and potential hazards, work processes, controls in place, policies and procedures and any training programs currently in place in their workplace. The committees were asked to rate the level of concern of the hazard they identified, and to identify what was felt were their overall training needs. There were, provisions on the survey for the J.H.S.C. Co-chairs to identify issues in the survey for which there was no agreement reached.

Accompanying each Hazard Information Survey was a Resource Guideline. It contains information which was designed to be useful to the J.H.S.C.'s in identifying hazards in their workplace. Examples of hazards were introduced in the Guideline including accompanying work activities, areas where they may be found, types of controls and examples of existing training programs. Most of the examples were chosen specifically for the Transportation Sector while some were more general in nature and could apply regardless of the sector being surveyed. It was emphasized that these examples were not exhaustive and were only intended to provide a starting point for the J.H.S.C. Co-chairs in completing the Hazard Information Survey.

The objective of the survey was to have the J.H.S.C. Co-chairs fill out one single survey together. Through the Resource Guidelines they were encouraged to use any applicable information related to health and safety. They were encouraged to use such sources as:

- chemical inventories and Material Safety Data Sheets;
- Workers' Compensation Reports (claims);
- accident, injury or illness records;
- committee meeting minutes and inspection reports;
- sampling/test data;
- orders/noncompliances;
- near-miss reports;
- work-flow or process-flow information;
- general observations;
- individuals in the workplace with knowledge or experience of the hazards.

The Chief Executive Officer or some one of prominent position over health and safety were contacted first at each firm selected. Once the firm was comfortable with participating in the survey, and provided us with the J.H.S.C. Co-chair names from Labour and Management then further contacts were made. Both the Labour and Management Transportation Sector Coordinators provided their respective phone numbers and facilitated the Co-chairs through out the process of filling out the surveys. Each Committee was given a four week time frame to complete the package and return them to the attention of the Project Specialist, Peter Ellis, at the Workplace Health and Safety Agency.

The returned surveys were duplicated minus the firm name, address and co-chair names. This facilitated confidentiality to the survey participants as well as furthering objectivity by the Coordinators during input. By providing this information, the participating J.H.S.C.'s had the opportunity to highlight issues that were of concern to them and to identify areas of training that would benefit their certified members. Their input has proven invaluable to the process and has provided us with information that would not have been at our disposal otherwise.

FOLLOW-UP INTERVIEWS

Both of us as Coordinators have made the commitment that during module development we will make one on site visit and follow-up interview per sub-sector. The criteria we will be using to observe the operations at the participating firms is drawn from our experiences at the Transportation Safety Association of Ontario and the Workers Health and Safety Centre.

Criteria to be used will include:

- previous and present training, duration of training and who has and will deliver such training;
- yard conditions, refuelling areas, material handling equipment;
- committee concerns;
- work processes and the hazards generated by such;
- any pertinent records, minutes or reports shared with us;
- any recognized hazard because of our previous experience.

It is important that prior to completing module development we have a thorough understanding of the hazards associated with each sub-sector. On site interviews will reinforce our concerns."

LITERATURE SEARCHES

To supplement the information solicited and received from the J.H.S.C.'s, we embarked on an extensive research task. We were fortunate to have access to both the Workers Health and Safety Centre and Transportation Safety Association of Ontario in-house libraries. As well we used the research staff at both H.S.D.O.'s to acquire additional documents. Information was obtained from the University of Toronto, Canadian Centre for Occupational Health and Safety, Ministry of Labour Library as well as various governmental ministries. We also acquired numerous training packages developed by the H.S.D.O.'s.

We acquired information first on the Transportation Sector as a whole, then by rate group, next by specific processes and hazards. We categorized the information by rate groups or general to the sector to assist our hypothesis on specific modules. The literature we have acquired and digested has allowed us to facilitate the Hazard Information Survey results with information not raised on the surveys.

Refer to the Bibliography and Appendix 4 which lists all of the research we have used to either help define and develop the sector configuration or generate our list of proposed modules to be developed.

W.C.B./M.O.L./DATA REVIEW

W.C.B. Statistics

We acquired the W.C.B. statistics according to rate groupings assigned by the Workplace Health and Safety Agency to the Transportation Sector. Information was categorized by rate group and by the nature, source and type of industry. The statistics are based on the number of lost time claims which occurred in the years 1990, 1991, and 1992 for which compensation has been received (as of November 1, 1993). Claims by injury and diseases are combined because of differing interpretations of the definition of disease and injury by the W.C.B. and some of the Health and Safety Delivery Organizations. Included with the information we analyzed were the total number of allowed fatality claims in each of the rate groups within the Transportation Sector by year (1990, 1991, 1992). W.C.B. Statistics for the year 1993 will be available in May 1994. In each sub-sector, we flagged the most prominent and common injuries according to number of days lost and by monies spent. This afforded us the opportunity to determine if there were any hazards, by sub-sector, not recorded in the Workplace Hazard Information Survey.

M.O.L. Data

We acquired a copy of a document entitled Facts and Figures, produced by the Health and Safety Policy Branch, Policy and Analysis Unit, Operations Division, Ministry of Labour. This document provided us with an aggregate view of health and safety in Ontario looking first at the sectors (Mining, Construction and Industrial). The document segregated the information by industry with Transportation, Communication and Utilities being a component of the Service Industry. Some of the pertinent data in the report included information on employment, lost time injuries and incidence, total cost for all lost time incidence, injury frequencies and average days lost. The report also looked at Ministry of Labour activities including field visits, consultations and responses to workplace accidents, critical injuries, fatalities, work refusals, complaints, disputes, occurrences, occupational illnesses and diseases and reprisals. Also noted in the report was a summary on M.O.L. enforcement activities and prosecution activities.

In requesting M.O.L. data specific for the Transportation Sector, we referred to the industry groupings by 1980 Standard Industrial Classification codes. The information supplied by them is listed below categorized by reports.

First report:

Total Events

- accidents
- disputes
- occurrences
- work refusals
- complaints
- reprisals
- work stoppages
- occupational health and safety illnesses/diseases

This listing also includes any sub-headings where they exist, for example, accidents: fatal, critical.

Second report:

Field Visit Activity Summary

- cases
- case type
- orders issued
- nature of order

Third report:

Most Frequently Issued Orders (top 10, 20, 40) orders issued

includes:

- Act identifier
- section of Act
- sub-section of Act
- clause
- Regulation description
- section
- sub-section, etc.

The information covering the period from January 1, 1992 to January 1, 1994 was sorted by sector and correlated with the survey data results to determine if there are any hazards that were not born out by the J.H.S.C.'s when completing their surveys.

Canadian Centre for Occupational Health and Safety (C.C.O.H.S.) Fatality Reports

We were successful in obtaining a summary of fatality reports from the C.C.O.H.S. for the industries in the Transportation Sector for the last several years. This enabled us to get a better understanding of the types of hazards that caused the specific fatalities. These fatality reports are based on the Coroners' Reports and included many pertinent facts as well as the Coroners' recommendations. Some of the recommendations identified training needs and have been used along with other information sources to facilitate the Workplace Hazard Information Surveys to premise the recommendations we will be making.

Consulted Constituents

Refer to Appendix 1 to view a list of constituents within the Transportation Sector we have consulted. Some of the constituents were contacted by phone, and all of those listed in Appendices 2 were provided with a Workplace Hazard Information Survey package which included the Resource Guideline, Workplace Health and Safety Agency explanatory information and a letter signed by both coordinators inviting their participation in the process by filling out the survey. As well the leadership at both the Workers Health and Safety Centre and the Transportation Safety Association of Ontario were most helpful in providing input and giving feedback during the process of this needs analysis. This information was compiled and analyzed. Any hazards that were brought to our attention by this group were included in part of the decision making process when developing our recommendations for module development.

HEALTH AND SAFETY DELIVERY ORGANIZATIONS (H.S.D.O.)

Listed in Appendix 2 are the training programs that are provided by the H.S.D.O.'s that will be used as reference material when developing modules specific for the Transportation Sector. This information was obtained from a document prepared by the Policy and Research Department at the Workplace Health and Safety Agency dated March 25, 1994. The courses pertinent to the Transportation Sector have been sorted and categorized by their relevance to our proposed modules for this sector. Some of the courses listed are generic in content and others are specific but geared to other sectors. We feel that each course will have some significance in developing the content of our modules listed.

JOINT HEALTH AND SAFETY COMMITTEE SELECTION

By developing a strategy in selecting our candidate Joint Health and Safety Committees (J.H.S.C.'s), we realized our goal of targeting a best guess representation of the Transportation Sector and its subsequent sub-sectors. Geographically, we used the Transportation Safety Association's eleven territories. After amassing, by rate groups, all of the member firms on the Workplace Health and Safety Agency's data system for this sector we were able to select J.H.S.C.'s throughout the Province of Ontario.

The Agency Data System is a computer system belonging to the Workplace Health and Safety Agency (WHSA), that provides information on firms and injuries/diseases that have resulted in Workers' Compensation Board (WCB) claims. Basic information on the firms and claims are downloaded from the (WCB) at regular intervals, by the agency, and loaded into the Agency Data System. A subset of the data is installed at Transportation Safety Association of Ontario (TSAO), containing information on the firms and rates designated to TSAO that fall into the Classes:

- D - Manufacturing (1 rate)
- E - Transportation and Storage (10 rates)
- F - Retail and Wholesale Trades (2 rates)

Transportation Sector Coordinators' Report

This system is also maintained by WHSA. Additional information on branch addresses, firm contracts, etc. can be added by designated staff at TSAO. Only authorized people can access this system and to confirm the information required for the Sector Specific Training the Coordinators of this project only had access to firm name, firm number, address, telephone number and rates.

Each sub-sector was analyzed to determine the average size of the firms. Firms were then selected with the majority per sub-sector meeting the average size criteria yet ensuring that the larger firms and smaller firms were also represented.

Next we sorted the firms by organized verses unorganized to ensure that in the bipartite spirit of this project we had equal representation. In sorting the organized we also strived to select firms that were proportionately represented by respective Unions.

On average, we were able to send surveys to eleven firms per sub-sector. A total of eighty-five surveys were sent with a response rate of eighteen percent. Below is a list of the number of surveys that were sent by sub-sector.

Table 5 - Summary of Surveys Sent - By Rate Group

Class	Old Rate	New Rate	Description	No. of Surveys Sent
D Manufacturing	692	497	Ready-Mix Concrete Industry	11
E Transportation & Storage	674	551	Air Transport Industries	•
E Transportation & Storage	674	553	Air Transport Services	•
E Transportation & Storage	665	560	Warehouse Industry	8
E Transportation & Storage	656	570	General Trucking	8

Transportation Sector Coordinators' Report

Class	Old Rate	New Rate	Description	No. of Surveys Sent
E Transportation & Storage	656	577	Courier Service Industry	*
E Transportation & Storage		580	Bus, Rail & Water Transport Industries	18 **
E Transportation & Storage	683	582	Cargo Handling	N.A.
E Transportation & Storage	709	584	School Bus Operations	9
E Transportation & Storage	709	586	Taxicab & Limousine Service	8
E Transportation & Storage	709	590	Ambulance Service	***
F Retail & Wholesale Trade	692	681	Lumber and Builder's Supplies	11
F Retail & Wholesale Trade	717 & 726	689	Waste Materials (Recycling)	12
* No companies with more than 20 employees who fall under the jurisdiction of the Occupational Health & Safety Act of Ontario were found.				
** Rail or water were not surveyed in this rate group as there were no companies found with more than 20 employees who fall under the jurisdiction of the Occupational Health & Safety Act of Ontario.				
*** Now covered under the health care sector.				

SURVEY

The information presented in this section of the report is as mentioned earlier not meant to be statistically correct and it is not the intent of the authors to suggest the hazards listed in the survey are conclusive and representative of all the hazards in each sub-sector. Extensive literature research has been conducted in preparing this report and the survey findings will be supplemented in the next segment of this section entitled Research. The response to the surveys was adequate for some of the sub-sectors yet one sub-sector -Waste Recycling - had no response.

Listed in Appendix 3 are the results reported by hazard groupings chemical, biological, physical, stress, work design and safety. Each hazard is listed only once regardless of the number of times it appears. Where hazards appear repeated is because of different spelling or phrases describing the hazard.

Some of the chemical hazards listed include diesel, propane, and gasoline fuels, vehicle emissions, asbestos, calcium chloride, acids, paints, silica, varsol, welding rods, brake fluids and thinners.

Biological hazards listed include aids-herpes, bacteria/fungi, cockroaches/insects, humane wastes, fungi, moulds and viruses.

The physical hazards listed include noise, heat, cold, radiation from the sun, radiation from welding, non iodizing radiation, V.D.T.'s and vibration.

Stress hazards listed include split shifts, driving conditions affected by night, traffic and weather. Also included are scheduling time, lack of supervision, repetitive work, job security, verbal abuse, violence/theft, working alone, dispatching, emergency response and meeting deadlines.

Workplace design hazards include air quality, ventilation, lifting, hoisting, steering, seating, reaching, racking, fork lift operating, conveyor lines, loading and unloading, falling, assisting disabled and garage repair areas.

Some of the safety hazards listed include brake chambers, electrical, confined space, inflating tires, vehicle accidents, eye and foot injuries, guarding, uneven ground, slips and falls, propane fires, welding and concrete chipping.

For a complete list of survey hazards reported see Appendix 3.

RESEARCH

Literature Searches

Work organization is a hazard for the transportation industries recognized in several research papers. In the article, Transport by Road¹ hours of work are highlighted as a considerable factor in injuries and illnesses in the transportation industry. The article emphasizes noise, exhaust fumes, rheumatic disorders and hypnotic hallucinations as concerns for this industry. In The same article fatigue and dozing off during driving were responsible for over 50% of the accidents studied with night time accidents exceeding ones during the day. The level and duration of the load, monotony and circadian rhythm were contributing factors in some of the accidents. Over 32% of the accidents studied resulted in rear end collisions, while 15% ran off the road.

The same article broke down accidents during loading and unloading of cargo operations. Eighty Eight percent of the injured were drivers or helpers, 95% were from falling off the bed of the truck or getting in or out of the cab, and 60% of these accidents resulted in injuries to legs or feet as well as lower back and hand injuries. Also mentioned was that 80% of accidents with liquid bulk transport involved transporting dangerous goods while 40% of those accidents resulted in vehicles that rolled over, majority caused by shift in weight.

The article also emphasised causes of accidents during vehicle repair. The main concerns cited include improper use of hand tools, falling hazards, asbestos exposure, lead absorption, exhaust gases, noise and vibration, dermatitis and welding fumes and flash.

Work organization as a hazard is also cited in articles entitled Job Strain and Blood Pressure² and Variations in Drivers' Cognitive Load³.

¹ *Occupational Safety and Health in Road Transport*, Transport, by Road, Inland Transport Committee, Eleventh Session, Geneva, 1985.

² *Job Strain and Blood Pressure*, Scandinavian Journal of Work Environment and Health, Volume 17, Number 6, December 1991, Theorell T., et. al.

³ *Variations in Drivers' Cognitive Load*, Ergonomics, Volume 34, Number 2, 1991, Lisbeth Harms.

Workplace violence is cited as an increasing problem in the workplace in an article from the Wall Street Journal describing home deliveries in urban centres⁴. The Metro Toronto Police Department have released a study⁵ which demonstrates violence is an increasing hazard in many workplaces.

Ventilation, or lack of, is reported as a contributing hazard to warehouse workers' headache⁶. A case involving carbon monoxide poisoning from propane fuelled lift trucks is cited. As well the article Ventilation for Engine Exhaust Gases⁷ list the hazards of inadequate ventilation in operations such as vehicle repair and material handling when operating exhaust engine equipment.

Vehicle emissions are cited as a wide spread hazard in the transportation industry in numerous articles researched. In Effects of Exposure to Vehicle Exhausts on Health⁸ local respiratory exposure is raised as a concern including information linking exposures to mutagenic results. In a study done to measure air quality in the Sault Ste. Marie bus barn⁹ the importance of properly maintained ventilation systems were one of several recommendations. High concentrations of carbon monoxide measurements were also cited.

Work design or the lack of appropriate work design has been cited in many articles when dealing with occupational injuries in transportation industries. In a study commissioned by the Amalgamated Transit Union¹⁰ eight major recommendations were made concerning ergonomics. Also included in the study were stress factors common to the transit industry. One article, Seat Suspension and Whole Body

⁴ *Crime Becomes an Occupational Hazard of Deliveries*, Wall Street Journal, Brett Pulley.

⁵ *Selected Offenses*, Transportation, Metro Toronto Police Information Services, 1992.

⁶ *Warehouse Workers' Headache*, Journal of Occupational Medicine, January 1992, Thomas A. Fawcett, M.D., et. al.

⁷ *Ventilation for Engine Exhaust Gases*, Occupational Health Review, 1965, Rispler L., et. al.

⁸ *Effects of Exposure to Vehicle Exhausts on Health*, Scandinavian Journal of Work, Environment and Health, Volume 13, 1987, Ulf Ulvarson.

⁹ *Sault Ste. Marie Bus Barn Air Quality Assessment*, Occupational Health and Safety Services, Project 0268, March 1991, R.G. Rickman Associates Ltd.

¹⁰ *Amalgamated Transit Union - Transit Drivers Health Study*, Ontario Workers Health Centre, March 1987, Stan Gray, Director.

Vibration of Professional Drivers¹¹ listed the musculoskeletal injuries (M.S.I.) associated with improper seat design. The article entitled Orthopaedic Diseases Among Transport Workers¹² reports M.S.I. 1.22 times higher for transport workers with the greatest portion in the lumbar area of the spine. This article also sites studies which show a large number of spinal injuries at career beginnings which indicates a lack of proper training.

Noise and vibration were recognized as hazards in the article Transport by Road¹³. The article noted that below 30 km/h the noise level was independent of speed with readings from 69 to 87 db(A) and at higher speeds the noise level increased about 9 db(A) for each doubling in speed.

Proper personal protective equipment is discussed in the article, What to Wear in Your Warehouse¹⁴ siting the importance of proper fit, training and use of equipment specific to warehousing industries.

In an article, The Design of Manual Handling Tasks¹⁵, many of the hazards associated with material handling are sited with examples from the transportation industry. In the article, Transport In-plant¹⁶ hazards associated with lift trucks, over head cranes and other material handling devises are recognized.

In the document, Dangerous Goods Guide to Initial Response¹⁷ the hazards of not having an emergency plan are accompanied with legal responsibilities of dangerous goods carriers.

¹¹ *Seat Suspension and Whole Body Vibration of Professional Drivers*, The Annals of Occupational Hygiene, Volume 37, Number 1, 1993, Alex Burdorf, et. al.

¹² *Orthopaedic Diseases Among Transport Workers*, Occupational and Environmental Health, 1988, Springer Verlag, et. al.

¹³ Refer to Footnote 1.

¹⁴ *What to Wear in Your Warehouse*, Safety and Health, February 1993, Mick Hans.

¹⁵ *The Design of Manual Handling Tasks*, Ergonomics, 1978, Volume 21, Number 12, Stover H. Snook.

¹⁶ *Transport, In-plant*, Inland Transport Committee, Eleventh Session, Geneva, 1985.

¹⁷ *Dangerous Goods Guide to Initial Response 1986 & 1991*, Canutec, Federal, Ministry of Supply and Services.

Hazards of vehicle repair were stated earlier in this summary. Re-enforcing that recognition is a section in a report entitled Occupational Exposure to Welding and Cutting Hazards¹⁸ which sites that 11% of all injuries during welding and cutting operations, were mechanics and repairmen in the transportation industry and that 3% of those injuries involved fires and explosions. As well in a case study reported in the article Pleural Mesothelioma in a Lift Mechanic¹⁹ brake repair workers and lift truck mechanics, experienced a relatively high incidence of pleural mesothelioma. Equally important are the hazards associated with improper vehicle inspection. The Ministry of Transportation of Ontario participated in a road side safety check in the trucking industry²⁰. It should be noted that in the Ministry of Transportation of Ontario's publication from which this table was taken, the decrease in out-of-service rate was disappointingly small considering industry's awareness of the survey and the implementation of a mandatory annual inspection program that has been in effect since January 1, 1992. See Table 6 for the results of the survey for the last three years.

Table 6 - Roadcheck 1993, Historical Trends

		May 1991	May 1992	May 1993
No. of Inspections		2,672	3,087	2,911
No. of Air Brake Systems Inspected		N/A	2,743	2,601
No. of Hydraulic Brake Systems Inspected		N/A	344	311
Out-of-Service for:	Overall Mechanical Fitness	34%	37%	33.4%
	Air Brake Systems	30%	31%	29.2%
	Hydraulic Brake Systems	N/A	6.7%	4.8%
	Light Systems	5%	4%	3.3%
	Steering Systems	1%	2%	1.3%
	Tires	2%	2%	2.6%

¹⁸ *Occupational Exposure to Welding and Cutting Hazards in Ontario*, Ontario Ministry of Labour, Occupational Health and Safety Division, Development Unit, January 1985, Thomas J. Robinson, et. al.

¹⁹ *Pleural Mesothelioma in a Lift Mechanic*, British Journal of Industrial Medicine, Volume 46, Number 7, July 1989, Huncharek M., et. al.

²⁰ *Ontario's Participation in Roadcheck '93*, Ministry of Transportation of Ontario, 1993.

The article *Mortality Among Professional Drivers*²¹ sites studies observing higher incidence of lung, bladder, stomach, and colon cancer in transportation industry workers who are exposed to diesel exhaust. As well workers in this industry show higher incidence of bronchitis, emphysema, asthma and ischemic heart disease. The article *Lung Cancer in Motor Exhaust-Related Occupations*²², sites a study which found excesses of lung cancer for several motor exhaust-related occupations.

In the article *Traffic Injuries to Truck and Bus Occupants*²³ it is reported that in Sweden over one third of fatal occupational accidents are related to motor vehicles. It was further reported that traffic risks were neglected by occupational health and safety personnel compared to traditional risks. Also sited in this article was that collisions between vehicles accounted for 53% of accidents studied while overturning 27% and ejection 12% accounted for the other major crash factors. In another publication, *Motor Fleet Safety Manual*²⁴ the job safety record of the trucking and transit industry is below the average for all other private industries.

A study done in part by the Ministry of Transportation of Ontario²⁵ showed that in an inspection blitz of commercial vehicles travelling Ontario's highways during a three day period, 33% were put out-of-service. The primary reason for vehicles being removed from service was defective air brakes. The report included improved training recommendations.

²¹ *Mortality Among Professional Drivers*, Scandinavian Journal of Work, Environment and Health, Volume 17, Number 5, October 1991, Rafnsson V., et. al.

²² *Lung Cancer in Motor Exhaust-Related Occupations*, American Journal of Industrial Medicine, Volume 16, Number 6, 1989, Richard B. Hayes, et. al.

²³ *Traffic Injuries to Truck and Bus Occupants*, Journal of Occupational Accidents, Volume 11, Number 2, November 1989, Torgny Jarl et. al.

²⁴ *Motor Fleet Safety Manual*, 3rd Edition, National Safety Council 1986.

²⁵ *Ontario's Participation in Road Checks*, Ministry of Transportation, 1993.

Impact of Work-related and Psychosocial Factors on the Development of Ischemic Heart Disease Among Urban Bus Drivers²⁶ cited factors such as poor worker well being, work load, traffic, and scheduling as factors that influenced incidence of ischemic heart disease in urban transit.

Many more articles and studies could have been added to this list to enhance the hazards that were highlighted in the literature search, but to avoid repetition only a selected number were used. For a full listing of literature searched see Bibliography. Also see Appendix 4 for a list of Ministry of Transportation of Ontario and Transport Canada Publications searched.

Fatality Reports

Hazards that were identified by the fatality reports that we were able to access included vehicle repair hazards, fire and explosion hazards, load security hazards, transportation of dangerous goods hazards, vehicle inspection hazards, hazardous driving conditions, air brake hazards, lockout hazards, warehouse, dock and yard hazards, confined space hazards, personal protective equipment, heat and cold stress and hazards related to ventilation. Refer to Appendix 5 summarizing fatality reports. The hazards and training recommendations mentioned in this appendices are a summary of coroner and juror recommendations.

Workers' Compensation Board

Claim Counts by Nature of Injury

The following information pertaining to the nature of injuries sustained in the Transportation Sector was obtained from the Workers' Compensation Board.

The statistics reported are for a three year periods, 1990 to 1992 inclusive.

²⁶ *Impact of Work-related and Psychosocial Factors on the Development of Ischemic Heart Disease Among Urban Bus Drivers*, Scandinavian Journal of Work, Environment and Health, Volume 14, Number 4, August 1988, Bo Netterstrom.

In total there were 12,034 claims. The highest number of claims involved sprains, and strains with 6,464; followed by contusions, and crushing bruises 1790; fractures 821; cuts lacerations; punctures 671; scratches and abrasions 268; hernia and ruptures 196; multiple injuries 150; burns or scalds (heat) 63; injuries to nerves 81; dislocations 79; inflammation or irritation of joints 76; amputations or enucleations 52; toxic effects of substances 51; burns (other than thermal) 43; concussions, brain, cerebral 43; occupational illnesses not otherwise classified 17; dermatitis 14; contagious or infectious disease 12; hearing loss or impairment 7; heart conditions 6; electric shock, electrocutions 6; respiratory conditions 3; pneumoconioses 3; freezing, frostbite and other effects from freezing 2.

There were an additional 1,096 none classified injuries sustained as well. See Graph 1 in Appendix 6, Reports, 1989.

Also included with this document is Appendix 7 based on our analysis of data extracted from Workers' Compensation Board Workers Internal Retrieval System (WIRS), System 54, Reports 1989. The information in this appendices is based on injuries reported on Workers' Compensation Board Form 7's summarizing the rate, type and source of injury reported.

Ontario Ministry of Labour

Average Days Lost per Injury for the Transportation Sector

The following statistics for the Transportation Sector are based on information obtained from Statistics Canada Employment Dynamics, Small Business and Special Surveys Division for 1986, and the Workers' Compensation Board, Workplace Injury Retrieval System (WIRS) System 54, 1989.

The average number of days lost per injury for the Sector is based on the total days lost, divided by the total number of lost time incidences.

Water Transportation (SIC 504) has the highest number of days lost per injury with 53.3; followed by Taxi-Cab (SIC 512) with 47.7 days; Bus-Urban (SIC 509) with 27.6 days; Other (SIC 505) with 27.4 days; Bus Interurban (SIC 508) with 26.2 days; Other Storage and Warehousing (SIC 527) with 23.5 days; Miscellaneous (SIC 517) with 23 days; Moving and Storage Used Goods [uncrated] (SIC 506) with 23 days; Air (SIC 501) with 21.4 days; Rail (SIC 503) with 21.4 days; Other (SIC 502) with 18.1 days and Other Trucking (SIC 507) with 6.8 days. See Graph 2 in Appendix 6.

Percentage of Lost Time Injuries for the Sector

The following statistics for the Transportation Sector are based on information obtained from Statistics Canada Employment Dynamics, Small Business and Special Surveys Division for 1986, and the Workers' Compensation Board, Workplace Injury Retrieval System (WIRS) System 54, 1989.

The percentage of lost time injuries for the Transportation Sector is based on the total lost days divided by the total number of lost time incidences.

Water Transportation (SIC 504) has the highest percentage with 16.7%, followed by Taxi-Cab (SIC 512) with 14.9%; Bus-Urban (SIC 509) with 8.7%; Other (SIC 505) with 8.6%; Bus Interurban (SIC 508) with 8.2%; Other Storage and Warehousing (SIC 527) with 7.4%; Moving and Storage and Warehousing (SIC 527) with 7.4%; Moving and Storage Used Goods [uncrated] (SIC 506) with 7.2%; Miscellaneous (SIC 517) with 7.2%; Air (SIC 501) with 6.7%; Rail (SIC 503) with 6.7%; Other (SIC 502) with 5%; Other Truck (SIC 507) with 2.1%. See Graph 3 in Appendix 6.

Injury Frequency per One Hundred Workers for the Transportation Sector

The following Statistics for the Transportation Sector are based on information obtained from Statistics Canada Employment Dynamics, Small Business and Special Survey Division for 1986, and the Workers' Compensation Board, Workplace Injury Retrieval System (WIRS) System 54, 1989.

The Injury Frequency per one hundred workers is based on the total number of lost time injuries divided by total number of employees, multiplied by one hundred. See Graph 4 in Appendix 6.

Lost Time Injury Rate by Major Industry

The following information in Table 7 pertaining to injury rates by Major Industry was obtained from the Workers' Compensation Report (1992) and Statistics Canada - The Labour Force - Annual Averages Catalogue 71-002.

Table 7 - Lost Time Injury Rate by Major Industry

Industries	1990	1991	1992
Forestry	6.4	6.0	4.1
Mining	4.0	3.5	3.2
Manufacturing	6.8	5.6	4.9
Construction	5.1	3.9	3.2
Transportation, Communications & Utilities	4.4	4.1	3.8
Trade	3.6	3.1	2.9
Finance, Insurance & Real Estate	0.4	0.4	0.3
Services (Business & Personal)	2.2	2.0	1.8
Public Administration (Fed. Prov. & Municipal)	4.6	4.6	4.2

COMMON HAZARDS

- **Work Organization**

Hours of work, split shifts, scheduling time, working alone, and repetitive work are hazards which have been highlighted in the survey and supported by research. Symptoms from these hazards are similar and result in fatigue, disruption to the circadian rhythm. Recognition, assessment and controls require similar strategies.

- **Workplace Violence**

This hazard was recognized consistently through out the surveys returned. Literature supports the illnesses and injuries that result from this growing problem. Recognizing, Assessing and controlling this hazard will be similar as a majority of the Transportation Sector workers deal with the public as part of their job.

- **Confined Spaces**

It is a recognized hazard on the surveys and literature searches have demonstrated the hazard is common in many transportation sector firms that may have their own vehicle repair areas. One death was linked to this hazard in the fatality reports.

- **Lockout**

Improper lockout procedures have been linked to two deaths in this sector in reviewing the fatality reports. Recognizing, assessing and controlling this hazard will be similar right across the sector.

- **Ventilation**

This hazard was raised in the survey with research linking this hazard to the transportation industry. Recognition, assessment and control of this hazard will be similar across the sector.

- **Work Design**

Musculoskeletal injuries were raised on the surveys with ample research and statistics to support a concern for this problem in this sector.

- **Noise**

This hazard was sited on the surveys and through literature searches. It has been recognized as a hazard in the vehicles and out. Similar strategies exist in recognizing, assessing and controlling this hazard.

- **Vibration**

Vibration was raised on the survey and in research linking this concern to the industries in this sector. Strategies for recognizing, assessing and controlling are similar.

- **Hazards of Working at Heights**

This hazard was raised in the surveys as well as sited as a hazard in a fatality report for this sector. Understanding and controlling or eliminating this hazard is the same for all sub-sectors.

- **Personal Protective Equipment**

PPE was raised in the survey as well as attributed as a factor in a death reported in the fatality reports in this sector.

- **Machine Guarding**

This hazard was recognized in the survey and research has demonstrated that this hazard is common throughout the sector. Recognizing, assessing and controlling this hazard will be similar in nature.

- **Heat and Cold Hazards**

This hazard was sited in the surveys, through research and highlighted in a fatality report. The strategy for recognizing, assessing and controlling this group of hazards will be similar.

- **Material Handling**

Surveys, research and fatality reports demonstrated the importance of recognizing, assessing and controlling this hazard through out the Transportation Sector.

- **Fire/Explosion Hazards**

This group of hazards were recognized through the survey, research and fatality reports as a concern for workers in this sector. Strategies for recognizing, assessing and controlling these hazards are similar.

- **Biological Hazards**

Articles and survey data support the commonality of this hazard in the Transportation Sector. Recognizing, assessing and controlling strategies for this group of hazards are similar.

- **Electrical Hazards**

This group of hazards were raised on the surveys, through research and WCB/MOL data. Training regarding recognizing, assessing and controlling this group are similar.

- **Highway Traffic Act and National Safety Code**

Not understanding legislation pertinent to the transportation industry has been cited in survey data and fatality reports as a concern for this sector.

- **Hazards of Vehicle Repair and Vehicle Inspection**

Survey data, fatality reports and research has highlighted this hazard group as a concern for this sector. Strategies for recognizing, assessing and controlling this group are similar.

- **Hazards of Air Brakes**

This group of hazards were recognized on surveys, fatality reports and research as a hazard through out the Transportation Sector.

- **Vehicle Emissions**

This Group of hazards have many similar characteristics. All are the end results of combustion process of internal combustion engines and the waste product is the hazard. The effects to the body are similar and affect similar organs. Most enter through inhalation primarily. Assessment techniques are similar in that they are hard to accurately measure with out proper hygiene equipment. Controls are similar for this hazard and include substitution and engineering controls. Vehicle emissions were mentioned on the survey and supported by research.

- **Hazardous Driving Conditions**

Survey data, fatality reports and research emphasized this group of hazards in this sector. Recognizing, assessing and controlling this group will be similar in nature.

- **Load Security Hazards**

Research and numerous fatality reports recognized this group of hazards in the industries in this sector. Similar strategies can be used to deal with this group of hazards.

- **Transportation of Dangerous Goods**

Hazards associated with transporting dangerous goods were sited in fatality reports and supported by research. Strategies for recognizing, assessing and controlling this group of hazards are similar.

- **Chemical Hazards in the Transportation Sector**

This group of hazards which includes controlled products were recognized in survey data, fatality reports, and research. Recognizing, assessing and controlling this group of hazards is similar.

- **Warehouse, Dock and Yard Hazards**

Survey data, fatality reports and research sited this group of hazards for this sector. Strategies for recognizing, assessing and controlling this group of hazards are similar.

- **Motor Vehicle Accident Investigation**

Research has demonstrated that this skill is needed in this sector in order to better recognize, assess and control hazards which cause vehicle accidents in this sector.

- **Hazards of Stress in the Workplace**

Unique stress hazards to workers in dealing with the public and more specifically operating motor vehicles were raised in survey data and research information. Recognizing, assessing and controlling this group of hazards are similar in nature.

- **First Aid**

The hazards of dealing with the public and being in a position to assist the injured was cited in survey data and through research information.

- **Other Physical Hazards in the Transportation Sector**

This group of hazards were raised in survey data and research information. Recognizing, assessing and controlling have similar strategies.

- **Hazards of Power Tools in the Transportation Sector**

This group of hazards were cited in survey data and research. Recognizing, assessing and controlling this group of hazards is similar.

- **Aids in the Workplace**

This hazard was recognized in the surveys and through research data as most of the workers in this sector interact with a large portion of the public.

- **Modified Work Programs Designed for the Transportation Sector**

Although not recognized in survey data research has shown this to be a challenge for industries in the Transportation Sector. Recognizing, assessing and controlling a good program will be facilitated by similar strategies.

- **Other Legislation Pertinent to the Transportation Sector**

Research has demonstrated the need to look at other legislation that Transportation Sector workers are exposed to. The Gasoline Handling Act, Coroners' Act, Building Code etc.

- **The Scope of the Problem in the Transportation Sector**

Hazards in general have been recognized in survey data, research, fatality reports and statistics. Recognizing, assessing and controlling this aggregate group of statistical hazard information will require similar strategies.

COMMON HAZARDS ACROSS THE TRANSPORTATION SECTOR

In using WCB, MOL, NOC, research and constituent input in our needs analysis, we were able to draw the conclusion that many of the occupations in the Transportation Sector are similar and in most sub-sectors. Below is a list of hazard groupings found in the Transportation Sector. We are through, consensus agreement recommending that the following hazard groupings formulate the basis for module development.

1. Work Organization and Shift Work *
2. Workplace Violence *
3. Confined Space *
4. Lockout *
5. Ventilation *
6. Work Design - M.S.I. *
7. Hazards of Noise *
8. Hazards of Vibration *
9. Hazards of Working at Heights *
10. Personal Protective Equipment *
11. Machine Guarding *
12. Heat and Cold Hazards *
13. Material Handling in the Transportation Sector *
14. Fire explosion Hazards *
15. Emergency Training *
16. Biological Hazards in the Transportation Sector *
17. Electrical Hazards *

18. The Scope of the Problem in the Transportation Sector
19. Highway Traffic act & National Safety Code
20. Hazards of Vehicle Repair Operations & Vehicle Inspections
21. Hazards of Air Brakes
22. Hazards of Vehicle Emissions
23. Hazardous Driving Conditions
24. Load Security Hazards
25. Transportation of Dangerous Goods
26. Chemical Hazards in the Transportation Sector
27. Warehouse, Dock & Yard Hazards
28. Motor Vehicle Accident Investigation
29. Hazards of Stress in the Transportation Sector
30. First Aid
31. Other Physical Hazards in the Transportation Sector
32. Hazards of Power tools Used in the Transportation Sector
33. Aids in the Workplace
34. Modified Work Programs Designed for the Transportation Sector
35. Other Legislation pertinent to the Transportation Sector Including the Gasoline Handling Act, Coroners Act, Building Code.

* *Derived from suggested list of common modules.*

The modules we have suggested are based on our original mandate which is to recognize hazards in the Transportation Sector. The hazard groupings we have suggested are not based on individual hazards. They are based on recognizing, assessing and controlling the specific groups of hazards and will not duplicate any existing training programs whether legislative or hazard based. These modules are Transportation Specific in nature and that meets the purpose of this needs analysis.

Listed below in Table 8 is a matrix detailing our recommendations for sector specific programs based on the list of modules that we reached consensus agreement on. Each sub-sector is listed with a specific program aimed at meeting the needs of the sub-sector based on groups of hazards recognized as the result of the needs analysis conducted in the Transportation Sector.

Table 8 - Hazard-Based Modules for the Transportation Sector

Rate Group							
560	570	580	584	586	681	689	497
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	-	-	9	9	9
10	10	10	10	10	10	10	10
11	11	11	11	11	11	11	11
12	12	12	12	12	12	12	12
13	13	13	13	13	13	13	13
14	14	14	14	14	14	14	14
15	15	15	15	15	15	15	15
16	16	16	16	16	16	16	16
17	17	17	17	17	17	17	17
18	18	18	18	18	18	18	18

Transportation Sector Coordinators' Report

Rate Group							
560	570	580	584	586	681	689	497
19	19	19	19	19	19	19	19
20	20	20	20	20	20	20	20
21	21	21	21	-	21	21	21
22	22	22	22	22	22	22	22
23	23	23	23	23	23	23	23
24	24	24	-	-	24	24	24
25	25	25	25	25	25	25	25
36	26	26	26	26	26	26	26
27	27	27	27	-	27	27	27
28	28	28	28	28	28	28	28
29	29	29	29	29	29	29	29
30	30	30	30	30	30	30	30
31	31	31	31	31	31	31	31
32	32	32	32	32	32	32	32
33	33	33	33	33	33	33	33
34	34	34	34	34	34	34	34
35	35	35	35	35	35	35	35

RESEARCH AND LITERATURE SEARCH

1. Hans M., *What to Wear in Your Warehouse*, Safety and Health, February 1993.
2. *Occupational Health & Safety Issues in Waste Management*, Canadian Centre for Occupational Health & Safety, May 1991.
3. *Waste Management*, Designated as Wastes (Regulation 322/85).
4. *Worker's Compensation Board Statistics*, Workers' Compensation Board, As of November 30, 1992 for 1991.
5. Fawcett T.A., et. al., *Warehouse Workers' Headache*, Journal of Occupational Medicine, January 1992.
6. *Warehouse Workers' Headache (Letter to the Editor)*, Journal of Occupational Medicine, Volume 34, Number 9, September 1992.
7. Rispler L., Ross C.R., *Ventilation for Engine Exhaust Gases*, Occupational Health Review, 1965.
8. Ulfvarson U., *Effects of Exposure to Vehicle Exhausts on Health*, Scandinavian Journal of Work, Environment & Health, Volume 13, 1987, Page 505-512.
9. *Traffic Injuries to Truck & Bus Occupants*, Journal of Occupational Accidents, Volume 11, Number 2, Elsevier Science Publishers B.V., November 1989.
10. Gray S., *Amalgamated Transit Union - Transit Drivers Health Study*, Ontario Workers Health Centre, March 1987.
11. Langdon M., *Toronto Transit Commission - Diesel Exhaust*, Industrial Hygiene, March 1989.
12. Siemiatycki J., et. al., *Association Between Several Cancer Sites & Ten Types of Exhaust*, Scandinavian Journal of Work, Environment & Health, Volume 14, 1988, Page 79-90.
13. Burdprf A., Swuste P., *Seat Suspension & Whole Body Vibration of Professional Drivers*, The Annals of Occupational Hygiene, Volume 37, Number 1, 1993.

14. *Sault Ste. Marie Bus Barn Air Quality Assessment*, Occupational Health & Safety Services, Project Number 0268, R.G. Ryckman Associates Ltd., March 1991.
15. Bruce R.A., Fisher L.D., *Sudden Cardiac Incapacitation in Men Affecting Public Safety*, Journal of Occupational Medicine, Volume 31, Number 2, February 1989.
16. Siemiatycki J., *Risk Factors for Cancer in the Workplace*, Department of Epidemiology, University of Quebec, 1991.
17. Bartone P.T., *Predictors of Stress-Related Factors in City Bus Drivers*, Journal of Occupational Medicine, Volume 31, Number 8, August 1989.
18. *Workers' Compensation Board Statistics for Provincial & Municipal Government*, Workers' Compensation Board, Corporate Data Services, December 30, 1993.
19. Waldron, *Polycyclic Aromatic Hydrocarbons, A Preventive Medicine*, New York, June 1976.
20. *Transport, By Road*, Inland Transport Committee, 11th Session, Geneva, 1985.
21. *Transport, In-Plant*, Inland Transport Committee, 11th Session, Geneva, Switzerland, 1985.
22. *Transport, Urban*, Inland Transport Committee, 11th Session, Geneva, 1985.
23. *Pleural Mesothelioma in a Lift Mechanic*, Inland Transport Committee, 11th Session, Geneva, 1985.
24. Luttmann A., et. al., *Orthopaedic Diseases Among Transport Workers*, Occupational & Environmental Health, Springer-Verlag Publishers, 1988.
25. *Statistics Canada, Statistics for the Transportation Industry*, Statistics Canada, Transportation Division, Trucking in Canada, 1990.

26. Borchuk P., *Workers' Compensation Board Statistics for the Transportation Industry*, Workers' Compensation Board, Corporate Data Branch, November 10, 1993.
27. *Occupational Safety & Health in Road Transport*, Inland Transport Committee, 11th Session, Geneva, Report III, 10h, 1985.
28. *Occupational Cancer: Prevention & Control*, Occupational Safety & Health, Series Number 39, International Labour Organization, Geneva, Switzerland, 1988.
29. *Current Nitrogen Dioxide Exposure Among Railroad Workers*, American Industrial Hygiene Association, Volume 50, Number 7, July 1989.
30. *News Clippings - General*, Local Publications; Newspapers; Globe & Mail; Toronto Star; etc.
31. *News Clippings - Transportation*, Wall Street Journal; Globe & Mail; Toronto Star; Toronto Sun; etc.
32. *MSI in the Transport Sector (Draft #1)*, Workers Health & Safety Centre, September 21, 1991.
33. *Musculoskeletal Injuries Prevention Program (MIPP) Participants Manual [Transportation]*, Workplace Health & Safety Agency, ISBN: 07778-0667-3, July 1992.
34. Village J., *Ergonomic & Environmental Assessment of Haulage Trucks for Design Improvements*, British Columbia Research Corporation, Vancouver, B.C., 1989.
35. Flodmark B.T., Pase C., *Musculoskeletal Symptoms & Type a Behaviour in Blue Collar Workers*, British Journal of Industrial Medicine, Volume 49, Number 10, October 1992.
36. Walsh M.P., *Motor Vehicle Pollution Control Program for Canada*, Canadian Coalition on Acid Rain, 1990.
37. *VHB Research & Consulting*, McCormick Rankin Pilorusso Research Association Inc., April 1991.

38. Guillemin M.P., *Occupational Exposure of Truck Drivings to Dust & Polynuclear Aromatic Hydrocarbons (A Pilot Study in Geneva, Switzerland)*, Occupational & Environmental Health, Spring, 1992.
39. Rafnsson V., Gunnarsdottir H., *Mortality Among Professional Drivers*, Scandinavian Journal of Work, Environment & Health, Volume 17, Number 5, October 1991.
40. Cantor K.P., *Mortality Among Aerial Pesticide Applicators & Flight Instructors (A Reprint)*, Archives of Environmental Health, Volume 46, Number 2, March/April 1991.
41. Guidotti T.L., *Mortality of Urban Transit Workers*, Occupational Medicine, Volume 42, Number 3, 1992.
42. *Metro Police Violence Categories*, Canadian Centre for Justice Statistics, ISSN: 0715, 271x, December 1993.
43. *Metro Police Violence Categories*, Statistics Canada, 85-002, Volume 13, Number 6.
44. *Metro Police Violence Categories*, Metro Toronto Police Statistics at Transportation Sector Premises, 1989-1993 Inclusive.
45. Brisland C.E.S., McGill S., *Effects of a Mechanical Suspension Seat*, Proceedings of the Annual Conference of the Human Factors Association of Canada, 1989.
46. Hansson E., *An Ergonomic Checklist for Industrial Trucks*, Selected Work Categories of Concern, January.
47. Snook S.H., *Design of Material Handling Tasks*, Ergonomics, Volume 21, Number 12, December 1978.
48. Hayes R.B., et. al., *Lung Cancer in Motor Exhaust-Related Occupations*, American Journal of Industrial Medicine, Volume 16, Number 6, 1989.
49. Gustavsson P., et. al., *Lung Cancer & Exposure to Diesel/Bus Garage Workers*, Scandinavian Journal of Work, Environment & Health, Volume 18, Number 5, October 1990.

50. Theorell T., et. al., *Job Strain & Blood Pressure*, Scandinavian Journal of Work, Environment & Health, Volume 17, Number 6, December 1991.
51. Ashworth F., et. al., *Irritant Contact Dermatitis - Warehouse Employees*, Journal of Occupational Medicine, Volume 43, Number 1, 1993.
52. Anstadt G.W., *Whole Body Vibration in Subways & Adverse Health Effects*, Journal of Occupational Medicine, Volume 33, Number 5, May 1991.
53. *Inhalation of Filtered & Unfiltered Diesel Engine Emissions*, Journal of Applied Toxicology, Volume 6 (6), 1986.
54. Netterstrom B., *Heart Disease to Bus Drivers*, Scandinavian Journal of Work, Environment & Health, Volume 14, Number 4, August 1988.
55. Teanby D., *Fatal Injury due to Unrestrained Load*, British Journal of Industrial Medicine, Volume 49, Number 11, 1992.
56. French D.J., et. al., *Decision Making Style, Driving Style, Road Traffic Accidents*, Ergonomics, Volume 36, Number 6, 1993, Page 627-644.
57. West R., et. al., *Direct Observation of Driving, Self Reports of Driver Behaviour & Accident Involvement*, Ergonomics, Volume 36, Number 5, 1993.
58. Mansfield G., *Defensive Driving*, Safety & Health, National Safety Council, April 1990.
59. Balarajan R., McDowall M.E., *Drivers in London: A Mortality Study*, British Journal of Industrial Medicine, Volume 45, 1988, Page 483-486.
60. Raffle P.A.B., *Disability Rates of Bus Drivers*, British Journal of Industrial Medicine, Volume 31, 1974, Page 152-158.
61. Rosenkranz H.S., *Diesel Emissions/Cancer due to Genotoxic Mechanism*, Mutation Research, Volume 182, 1987, Page 1-4.

62. Sampara P., *Diesel Exhaust Emissions/Cancer*, Canadian Centre for Occupational Health & Safety, Number P86-17E, ISBN: 0-660-12190-5.
63. McCammon J.B., *Diesel Exhaust Emissions/Cancer*, U.S. Department of Health & Human Services, Current Intelligence Bulletin, Number 50, August 1988.
64. Schenker M.B., *Diesel Exhaust Emissions/Cancer*, Journal of Occupational Medicine, Volume 22, Number 1, January 1980.
65. McClellan R.O., *Diesel Exhaust/Case Study in Risk Assessment*, American Industry Hygiene Association, Journal 47(1), 1986, Page 1-13.
66. Dainty E.D., et. al., *Diesel Emissions Reduction*, Occupational Health in Ontario, Fall 1986.
67. Hammond S.K., et. al., *Markers of Exposure to Diesel Exhaust & Cigarette Smoke in Railroad Workers*, American Industrial Hygiene Association, Volume 49, Number 10, October 1988.
68. Woskie S.R., et. al., *Markers of Exposure to Diesel Exhaust & Cigarette Smoke in Railroad Workers*, American Journal of Industrial Medicine, Part I, Volume 13, 1988, Page 381-394.
69. Wade III J.F., Newman L.S., *Markers of Exposure to Diesel Exhaust & Cigarette Smoke in Railroad Workers*, Journal of Occupational Medicine, Volume 35, Number 2, February 1993.
70. *Commercial Motor Vehicle Highway Safety*, Ministry of Transportation, Ontario, 1989.
71. Harms L., *Variations in Driver's Cognitive Load (Dual-Task Performance)*, Ergonomics, Volume 34, Number 2, 1991, Page 151-160.
72. Yamazaki N., *Comfortability of Driver's Seat by Contact Shape*, Ergonomics, Volume 35, Numbers 5/6, Page 677-692.
73. Netterstrom B., *Cancer Incidence Among Urban Bus Drivers*, Occupational & Environmental Health, Volume 61, Number 3, 1988.

74. Jensen O.M., et. al., *Case Study on Bladder Cancer - Risk Among Drivers*, Scandinavian Journal of Work, Environment & Health, Volume 13, Number 2, April 1987.
75. *Carbon Monoxide - Monitoring Exposure*, Occupational Health & Safety, Alberta Medical Services Branch, MSB/27, May 1987.
76. Bernans H., *Diesel Exhaust Hazards*, The Windsor Occupational Safety & Health Council, 1983.
77. Mahoney D.P., *Carbon Monoxide Exposure from Lift Truck Exhaust*, Professional Safety - American Society of Safety Engineers, September 1990.
78. *Carcinogenic Risks to Humans*, World Health Organization International Agency for Research on Cancer, Volume 46, 1989.
79. Johanning E., *Back Disorders & Health Problems - Subway Train Operators - Whole Body Vibration*, Scandinavian Journal of Work, Environment & Health, Volume 17, Number 6, December 1991.
80. Dutcher J.S., et. al., *Biological Fate of Inhaled Diesel Exhaust Components*, American Industrial Hygiene Association Journal, Volume 45(7), 1984, Page 491-498.
81. Olsen M., *Bus Driving - Exhaustion & Exhaust Fumes*, Women's Occupational Health Resource Center, 1983
82. *Absenteeism in the Ontario Transit Industry*, Ontario Urban Transit Association, 1987.
83. *Cargo Control Systems, Catalog 352*, Aeroquip Industrial Division, 1990.
84. *Asbestos in the Workplace (A Series of Practical Workbooks)*, Council of Safety Associations, June 1982.
85. *Aviation Ground Operation - Safety Handbook*, 4th Edition, National Safety Council, 1988.
86. *CSA Standards on Lift Trucks*, Lift Truck Operator Training and Certification, Rexdale, Ontario, 1990.

87. *The Building Code*, Ministry of Municipal Affairs and Housing, Building Branch, August 1984.
88. Gerard J.M. Raymond, *Environmental Protection Act*, Queen's Printer of Ontario, August 1985.
89. *Emergency First Aid Modular Course*, St. John's Ambulance, St. John Priory of Canada Properties, 1985.
90. Baker J.S., Stebbins W.R. Jr., *Dictionary of Highway Traffic*, Northwestern University, 1960.
91. *Designated Substances*, Ministry of Labour, Ontario.
92. Sax I., *Dangerous Properties of Industrial Materials*, 6th Edition, Van Nostrand Reinhold Company, New York, 1984.
93. *Guide to Canadian Transportation of Dangerous Goods Act and Regulations*, International Compliance Centre, 1991.
94. *Dangerous Goods - Instructor's Manual*, Canadian Trucking Association, 1985.
95. *Dangerous Goods Transportation Act 1981, Bill 93*, Ministry of Transportation & Communications, Ontario, 1981.
96. *Dangerous Goods Guide to Initial Response, 1986 & 1991*, Canutec, Federal, Minister of Supply & Services, Canada.
97. *Dangerous Goods Regulations*, International Air Transport Association, 1992.
98. *Dangerous Goods - A Trucker's Guide*, Canadian Trucking Association, December 1989.
99. *Crane Handbook*, Const. Safety Association of Ontario, 1975.
100. *Crane Slinger Safety Seminar*, International Air Transport Association.
101. *Comprehensive Long Range Plan for Highway Traffic Safety*, National Safety Council, Highway Traffic Safety Division, October 28, 1985.

102. Bone J., *New Truck-Cab Designs Aim for Safety*, Safety and Health, January 1994.
103. Feyer A.M., Williamson A.M., *The Influence of Operational Conditions on Driver Fatigue in the Long Distance Road Transport Industry in Australia*, Designing for Diversity, Version 1, 1993.
104. Johansson S.E., Borg G., *Perception of Heavy Work Operations by Tank Truck Drivers*, Applied Ergonomics, Version 24, Number 6, December 1993.
105. Kecklund G, Akerstedt T., *Sleepiness in Long Distance Truck Driving*, Ergonomics, Version 36, Number 9, September 1993.
106. Wikstrom B.O., *Effects from Twisted Postures and Whole Body Vibration During Driving*, International Journal of Industrial Ergonomics, Version 12, Number 1-2, August 1993.
107. Beek V.D., et. al., *Loading and Unloading by Lorry Drivers & Musculoskeletal Complaints*, International Journal of Industrial Ergonomics, Version 12, Number 1-2, August 1993.
108. Hunt K., *Rack and Opinion (Practical Guide to Safe Racking)*, Occupational Safety and Health, Version 23, Number 6.
109. Smith R.B., *Industry Profile: Materials Handling*, Occupational Safety and Health, Version 62, Number 7.
110. Donati P., et. al., *Vibration in Industrial Vehicles & Earth-Moving Machines*, Safety and Health Practitioner, Number 513, May 1993.
111. Bone J., *Chisel Out a Hand-Tool Ergonomics Plan*, Safety and Health, Version 147, Number 5, May 1993.
112. Hansen E.S., *A Follow-Up Study on the Mortality of Truck Drivers*, American Journal of Industrial Medicine, Version 23, Number 5, 1993.
113. Wilderdg, *The Biomechanics of Vibration and Low Back Pain*, American Journal of Industrial Medicine, Version 23, Number 4, 1993.

114. Burdorf A., Swuste P., *The Effect of Seat Suspension on Exposure to Whole Body Vibration of Professional Drivers*, Annals of Occupational Hygiene, Version 37, Number 1, February 1993.
115. Swartz G., *Forklift Safety Training: Tips for Improving Your Program*, Professional Safety, Version 38, Number 1, January 1993.
116. Beek V.D., et. al., *Working Postures and Activities of Lorry Drivers*, Applied Ergonomics, Version 23, Number 5.
117. *Seat Belt Law - W.A. Forklift Drivers*, Australian Safety News, Version 63, Number 7, August 1992.
118. Corporate, *Driver Training Regulations Come into Force*, Great Britain Health and Safety News Bulletin Service, Number E115, July 1992.
119. Corporate, *Road Transport in Factories and Similar Workplaces*, Great Britain Health and Safety News Bulletin Service, GS9 January 1992.
120. Hopkins A., *Truck Deaths: A Suggestion*, Journal of Occupational Health & Safety, Australia & New Zealand, Version 8, Number 3, June 1992.
121. Steenland K., et. al., *Exposure to Diesel Exhaust in the Trucking Industry and Possible Relationships with Lung Cancer*, American Journal of Industrial Medicine, Version 21, Number 6, June 1992.
122. Guillemin M.P., et. al., *Occupational Exposure of Truck Drivers to Dust and Polynuclear Aromatic Hydrocarbons*, International Archives of Occupational & Environmental Health, Version 63, Number 7, 1992.
123. *Death on the Roads*, Hazards, Number 36, December 1991.
124. King W., *Transport Work: The Statistical Profile*, Canadian Centre for Occupational Health & Safety, Number 14, December 1993.

125. Eisma T.L., *Vibration Damping in Truck Drivers' Seat*, Occupational Safety & Health, Version 60, Number 11, November 1991.
126. Pope M.H., et. al., *To Drive Without Low-Back Pain*, Occupational Safety & Health, Version 60, Number 11, November 1991.
127. Zaebst D.D., et. al., *Quantitative Determination of Trucking Industry Workers' Exposure to Diesel Exhaust Particles*, American Industrial Hygiene Association Journal, Version 52, Number 12, December 1991.
128. Rafnsson V., et. al., *Mortality Among Professional Drivers*, Scandinavian Journal of Work, Environment and Health Version 17, Number 5, October 1991.
129. *Motor Fleet Safety Manual*, 3rd Edition, National Safety Council, 1986.
130. Wyckoff D.D., Maister D.H., *The Motor-Carrier Industry*, Lexington Books, 1977.
131. *National Safety Code in Ontario*, Transportation Regulations in Ontario.
132. Robinson T.J., Dranitsaris P., McTague L.C., *Occupational Exposure to Welding & Cutting Hazards in Ontario, Part I & II*, Ministry of Labour, Ontario, Occupational Health & Safety Division, Development Unit, January 1985.
133. Shaw A.G. Edgar; *Occupational Noise Exposure & Noise Induced Hearing Loss: Scientific Issues, Technical Arguments & Practical Recommendations*, National Research Council, Canada, October 30 1985.
134. *Province of Ontario Contingency Plan - for Spills of Oil & Other Hazardous Material*, Ministry of Environment, August 1987.
135. *Performance Evaluation of Several Jackknife Control Devices*, Ministry of Transportation, Ontario, November 1985.

136. *Solvents in the Workplace, Alliance Handbook of Organic Industrial Solvents*, 5th Edition, Industrial Accident Prevention Association, 1980.
137. *Report of the Special Advisory Committee on the Noise Regulation*, December 1985.
138. Billing A.M., *Rollover Tests of Double Trailer Combinations*, Ministry of Transportation & Communication, Ontario, December 1982.
139. Clifford L., *Road Worthy - Becoming a Responsible Driver*, Ministry of Transportation, 1985.
140. *Power Under Control*, MTO, McClelland & Stewart Ltd, 1976.
141. Mercer W.R.J., *Test & Demonstration of Double & Triple Trailer Combinations*, Ministry of Transportation, 1982.
142. Billing D.J.R., *Tests of a B-Train Converter Dolly*, Ministry of Transportation, 1983.
143. *Transfers and Lifts for Caregivers*, Health Care Occupational Health & Safety Association, Legislative Services, Media Centre, 1986.
144. *Canadian Trucking Association Safety Manual*, Canadian Trucking Association, 1992.
145. *Industrial Lift Truck Operator Training - Materials Handling & Logistics*, Canadian Standards Association, ISSN: 0317-5669, March 1994.
146. *Draft, Amended Part IX (Confined Spaces) of the COSH Regulations & Section by Section Explanations*, October 1992.
147. *An Equipment Operating Costs Comparison*, The Maintenance Council, American Trucking Associations, Technical Report.
148. *Truck and Bus, National Safety Code, Transportation Regulation in Ontario*, Ministry of Transportation, Ontario, February 1991.
149. *Accident Facts*, 1993 Edition, National Safety Council, 1993.

150. *ORSAR 1990, Ontario Road Safety Annual Report*, Ministry of Transportation, Ontario, 1990.
151. *Ontario's Participation in Roadcheck*, Ministry of Transportation, Ontario, 1993.
152. *Attacking Workplace Issues*, Ergonomics, Department of Kinesiology, University of Waterloo, 1992.
153. *Living with Shift Work*, Ontario Pulp & Paper Makers, Association, 1993.
154. *The Fire Code*, Ministry of the Solicitor General, Office of the Fire Marshal, February 1987.
155. Graffy H., *Safety Sense on the Road*, Safety Sense Enterprises, 1988.
156. *Coroners' Act, Revised Statutes of Ontario*, 1990, Chapter C37, Queen's Printer for Ontario, January 1, 1993.
157. *Gasoline Handling Act, Revised Statutes of Ontario*, 1990, Chapter G4, Queen's Printer for Ontario, September 1993.
158. *Maximum Weights in Load Lifting and Carrying*, International Labour Office, Geneva, 1988.
159. *Protection of Workers Against Noise & vibration in the Working Environment*, International Labour Office, Geneva, Switzerland, 1977.
160. *Hours of Work & Rest Periods in Road Transport*, International Labour Office, Geneva, 1979.
161. *Wood Dust Exposure in Ontario*, Ministry of Labour, Ontario, Occupational Health & Safety Branch, The Occupational Health Aspects, Program Development Unit, March 1986.

TRANSPORTATION SECTOR COORDINATORS' REPORT

S U M M A R Y O F A P P E N D I C E S

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CONSULTED CONSTITUENTS

1. Trade Associations for Transportation Sector
2. Affiliate Union Contacts in Transportation
3. Transportation Safety Association of Ontario, Management
4. Transportation Safety Association of Ontario, Labour
5. Field Service, Workers Health and Safety Centre
6. Transportation Safety Association of Ontario

CONSULTED CONSTITUENTS

1. Trade Associations for Transportation Sector

<p>Mr. Harold Markle President Ontario Recovery Group P.O. Box 870, Muskoka Road 4 Cambirdge, Ontario N0B 1C0</p>	<p>Mr. Stanley T. Parker Executive Director Canadian Association of Recycling Industries 50 Gervais Drive, Suite 502 Don Mills, Ontario M3C 1Z3</p>
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<p>Mr. Donnie Cruse Canadian Towing Society 653 Winston Road Grimsby, Ontario L3M 4E8</p>	<p>Mr. Michael McCarthy President Canadian International Freight Forwarders P.O. Box 922 Mississauga, Ontario L5M 2C5</p>
<p>Mr. John Brittain President Canadian Association of Logistics Management 610 Alden Road, Suite 201 Markham, Ontario L3R 9Z1</p>	<p>Mr. Art. Joosse President ConCar Owner-Operators Association 1336 Sandhill Drive, Unit 3 Ancaster, Ontario L9G 4V5</p>
<p>Ms. Hannah M. Hancock Executive Vice President Lumber and Building Materials Association 4500 Sheppard Avenue East, Suite F Scarborough, Ontario M1S 3R6</p>	<p>Mr. David G. Milton Executive Director Ontario Lumber Manufacturers Association 55 University Avenue, P.O. Box 8 Toronto, Ontario M5J 2H7</p>
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CONSULTED CONSTITUENTS

1. Trade Associations for Transportation Sector

(cont'd)

Mr. Daniel Fryzuk Executive Director Toronto Trucking Association 555 Dixon Road Rexdale, Ontario M9W 2H7	Mr. Robert J. Miller President Canadian Steel Service Centre Institute 345 Lakeshore Road, East, Suite 501 Oakville, Ontario L1H 7L1
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Mr. John Hull General Manager Ready Mixed Concrete Association of Ontario 365 Brunell Road, Unit 3 Mississauga, Ontario L4Z 1Z5	Ms. Betsy Sharples Secretary Ontario Aggregate Carriers Association 555 Dixon Road Rexdale, Ontario M9W 1H8
Mr. David I. Kentish Executive Director Canadian Association of Warehousing and Distribution Services P.O. Box 125 Oshawa, Ontario L1H 7L1	

CONSULTED CONSTITUENTS

2. Affiliate Union Contacts in Transportation

<p>Amalgamated Transit Union 603 - 15 Gervais Drive Don Mills, Ontario M3C 1Y8</p> <p>Mr. Ken Foster</p>	<p>Ontario Public Service employees Union 100 Lessmill Road North York, Ontario M3B 3P8</p> <p>Mr. Bob DeMatteo</p>
<p>National Automobile, Aerospace & Agriculture Implement Workers Union of Canada 205 Placer Court Willowdale, Ontario M2H 3H9</p> <p>Ms. Cathy Walker, Mr. George Botic</p>	<p>United Food & Commercial Workers International Union 300 - 61 International Boulevard Rexdale, Ontario M9W 6K4</p> <p>Ms. Sue Yates</p>
<p>Canadian Brotherhood of Railway, Transport and General Workers 2300 Carling Avenue Ottawa, Ontario K2B 7G1</p> <p>Mr. James D. Hunter</p>	<p>United Steelworkers of America 607 - 200 Ronson Drive Etobicoke, Ontario M9W 5Z9</p> <p>Mr. John Perquin</p>
<p>CUPE - Ontario Regional Office 901 -305 Milner Avenue Scarborough, Ontario M1B 3V4</p> <p>Mr. Joe Divitt</p>	<p>United Transportation Union 350 Kenilworth Avenue North, Lower Floor Hamilton, Ontario L8H 4T3</p> <p>Mr. Dennis Schweitzer</p>
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CONSULTED CONSTITUENTS

3. Transportation Safety Association of Ontario Management

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<p>Mr. Ron W. Davidson General Manager Unique Personnel Services Inc 1639 London Road Samia, Ontario N7T 7L1</p>	<p>Mr. Ian J.C. Wisdom Manager of Safety and Environmental Lafarge Concrete Products 45 McIntosh Drive Markham, Ontario L3R 8C7</p>
<p>Mr. Leonard Longlois President & General Manager Chatham & district Ambulance 249 Rawleigh Street, P.O. Box 711 Chatham, Ontario N7M 5K8</p>	

CONSULTED CONSTITUENTS

4. Transportation Safety Association of Ontario Labour

<p>Mr. Ron Allain Director of Training Teamsters Joint Council 52 1194 Matheson Boulevard Mississauga, Ontario L4W 1Y2 Tel: (905) 624-0347 Fax: (905) 624-4031</p>	<p>Mr. Joe Divitt Health & Safety Representative Canadian Union of Public Employees, Ontario Div 305 Milner Avenue, Suite 901 Scarborough, Ontario M1B 3V4 Tel: (416) 292-3999 Fax: (416) 292-2839</p>
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CONSULTED CONSTITUENTS

6. Transportation Safety Association of Ontario

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EXISTING HSDO COURSES PERTINENT TO THE
TRANSPORTATION SECTOR

EXISTING HSDO COURSES PERTINENT TO THE TRANSPORTATION SECTOR

HSDO	Course	Length in Hours	Proposed Module
THIHSEP	Emergency First Aid & Accident Scene Management	4	Accident Investigation
TSAO	Commercial Motor Vehicle Accident Investigation	16	Accident Investigation
TSAO	Emergency First Aid & Accident Scene Management	4	Accident Investigation
WHSC	Infectious Diseases	3	Aids -
WHSC	Aids in the Workplace	3	Aids
TSAO	Air Brake "Z" Endorsement	10	Air Brake
WHSC	Hazards of Welding	3	Chemical Hazards
CSAO	Refrigerant & Air Conditioning Systems	2	Chemical Hazards
CUSSCO	Toxicology and Health Effects	4	Chemical Hazards
COSHA	Review of Health Effects - Toxic Substances	4	Chemical Hazards
ONRSA	Occupational Health & Industrial Hygiene	16	Chemical Hazards
WHSC	Hazards of Solvent Exposure	3	Chemical Hazards
MHSP	Confined Space Entry	8	Confined Space
EUSA	Confined Space Entry	4	Confined Space
CSAO	Working in Confined Spaces	2	Confined Space
IAPA	Confined Space Hazards	8	Confined Space
WHSC	Confined Space Entry	6	Confined Space
WHSC	Coroner's Inquest	9	Coroner's Inquest
CUSSCO	Asbestos Awareness	4	Designated Substances
WHSC	Hazards of Asbestos in Buildings	3	Designated Substances
CUSSCO	Working with Asbestos	16	Designated Substances
WHSC	Hazards of Asbestos	3	Designated Substances
WHSC	General Session on Designated Substances	3	Designated Substances
MHSP	Electrical Safety	?	Electrical

HSDO	Course	Length in Hours	Proposed Module
CSAO	Electrical Hazards	2	Electrical
MHSP	Blood Pathogens	?	Emergency Planning
IAPA	Developing Your Safety Plan	16	Emergency Planning
CSAO	Welding and Cutting Hazards	2	Emergency Planning
(FP)	Emergency Evacuation Training	8	Emergency Planning
CSAO	Housekeeping/Fire Prevention	1	Emergency Planning
WHSC	Critical Incident and Post Traumatic Stress	3	Emergency Planning
IAPA	Emergency Preparedness	8	Emergency Planning
MHSP	Fire-Fighter Hazards	?	Emergency Planning
COSHA	Monitoring and Controlling Airborne Hazards	8	Fibres
WHSC	Man-Made Mineral Fibres	3	Fibres
THIHSEP	Emergency First Aid and Accident Scene Management	4	First Aid
TSAO	Emergency First Aid and Accident Scene Management	4	First Aid
WHSC	Transit	30	General
MSHP	Traffic Control	4	Hazards Driving Conditions
MSHP	Driver Improvement	4	Hazards Driving Conditions
TSAO	School Bus Driver Improvement Course	4	Hazards Driving Conditions
EUSA	Driver Improvement Program	4	Hazards Driving Conditions
TSAO	Commercial Driver Improvement Course (General)	4	Hazards Driving Conditions
WHSC	Seeing the Light	3	Hazards Driving Conditions
TSAO	Winter Driving - Staying in Control	1.5	Hazards Driving Conditions
CSAO	Winter Hazard Awareness	1	Heat Cold
MHSP	Heat Stress	?	Heat Cold
WHSC	Heat and Cold Stress	3	Heat Cold
WHSC	Office and Clerical Hazards	3	Indoor Air

HSDO	Course	Length in Hours	Proposed Module
COSHA	Indoor Air Quality: Causes and Solutions	1.5	Indoor Air
CUSSCO	Office Safety	4	Indoor Air
IAPA	Office Health and Safety	24	Indoor Air
WHSC	Indoor Air Quality	3	Indoor Air
CUSSCO	Indoor Air Quality	4	Indoor Air
CSAO	Tagging and Lockout	1.5	Lockout
CSAO	Working Around Live Apparatus	2	Lockout
ONRSA	Lockout Safety	8	Lockout
IAPA	Workplace Mechanical Safety	8	Lockout
WHSC	Lockout	6	Lockout
WHSC	Making Machinery & Equipment Safe	3	Machine Guarding
CSAO	Forklift Safety	1	Material Handling
WHSC	Material Handling	3	Material Handling
CSAO	Hand Tool Safety - Power Tools	2	Material Handling
CSAO	Power Actuated Tools - Power Tools	1.5	Material Handling
EUSA	Hydraulic Material Handling Equipment	8	Material Handling
TSAO	Lift Truck Operators' Course	6	Material Handling
WHSC	Forklift Training	18	Material Handling
ONRSA	Forklift Training	2	Material Handling
IAPA	Lift Truck Operators Safety	8	Material Handling
IAPA	Crane Slings Safety	8	Material Handling
ONRSA	Industrial Truck Hazard Recognition	4	Material Handling
CSAO	Power Tools	2	Material Handling
COSHA	Modified Work Program	8	Modified Work
ONRSA	Hearing Conservation and Noise Control	24	Noise
WHSC	PPE - The Last Resort	3	PPE
CSAO	Eyes/Foot/Hand/Head/Respiratory/Hearing	12	PPE
CSAO	PPE	1	PPE
WHSC	Stress	3	Stress
WHSC	TDG	6	TDG

HSDO	Course	Length in Hours	Proposed Module
TSAO	TDG	4	TDG
WHSC	Radiation	3	VDT's, EMF's
WHSC	Vehicle Emissions	3	Vehicle Emissions
WHSC	Principles of Ventilation	3	Ventilation
WHSC	Violence in the Workplace	3	Violence
WHSC	Violence in the Workplace (Workers)	3	Violence
COSHA	Violence in the Workplace: Prevent and Response	8	Violence
WHSC	Violence in the Workplace (Office)	3	Violence
IAPA	Safe Work Procedures Through Task Analysis	8	Work Design
MHSP	Back Power	4	Work Design
COSHA	Task Analysis/Assessing Job Demands	8	Work Design
ONRSA	Job/Task Analysis Procedures	8	Work Design
COSHA	Fitting the Job to the Worker (Ergo in Health Care)	8	Work Design
WHS A	MIPP	8	Work Design
WHSC	Designing Work for the Worker	3	Work Design
CUSSCO	Back Safety and Lifting Designs	4	Work Design
CSAO	Back Care	2	Work Design
COSHA	Transfers and Lifts for Caregivers	16	Work Design
WHSC	Preventing MSI for JHSC	9	Work Design
WHSC	Hours of Work	3	Work Organization
WHSC	Lighting Hazards	3	Yard Inspection

HAZARDS REPORTED ON THE HAZARD INFORMATION SURVEY

1. Chemical Hazards
2. Biological Hazard
3. Physical Hazards
4. Safety Hazards
5. Stress Hazards
6. Work Design Hazards

Chemical Hazards for the Transportation Sector

04-May-94

Chemical Hazards

Acetylene
Anhydrous ammonia
Anti-Freeze
antifreeze
Antifreeze - ethylene glycol
Antifreeze coolant
Asbestos
Asbestos coating
Batteries
Battery Acid
Bleach
Brake Blocks
brake cleaner
Brake dust
Brake Fluid
Brake Kleen
Brake Linings (non-asbestos)
Calcium Chloride
Cement Powder
Chasis Grease
Cleaners
Clutch Lining (non-asbestos)
Compressed Gases
Concrete, Mixed
CRC 556 (lubricant)
Degreaser
Degreasers
Degreasing Parts Washer
Detergents
Diesel
Diesel Exhaust
diesel fuel
Diesel fuel (potential)
Diesel Fuel Conditioner
Diesel Vapours
Door cleaner
eccetaline

Chemical Hazards

ether
Exhaust Fumes
Forte Lubricating Spray
Fuel exhausts
fuel oil
Fuels
Gas
Gas Line Antifreeze
Gas Treatment
Gasoline & Diesel
Glycol
Glycol (engine coolant)
Grease
HC 20 caustic soda
Hydrochloric Acid
Isocyanates
Kelox C-11, 10-F
Kork buster solvent
Kork klew
Liquid toilet bowl cleaner
LNG
Loctite, Small Dropper
lubricants
Methyl Hydrate
motor oil
MPZZZ Soap
Oven Cleaner
Oxygen
Paint
Paint Fumes
paints
Propane
Ready Mix Concrete
Reducers
Rodent and insect poisons
Rusty 2000 Spray Can
safety brake
Silica
solvents
Spill absorbent

Chemical Hazards

Starting Fluid Ether

Sulphuric/lead acid storage battery

Thinners

transmission fluid

trl-37 Trucoat

Truck Fumes

varsol

Vehicle Exhaust

Vehicle Wash Exterior

vinyl cement

Welding Rod

welding rods

Windshield wash (methanol)

Windshield Washer Fluit

WindShield Washer, Anti-Freeze

Windshield Washer/Anti-Freeze

Biological Hazards for the Transportation Sector

04-May-94

Biological Hazard

aids-herpes

Bacteria

Bacteria, Fungi

bacteria/fungi

Bacterial

Cockroaches

Contact disease

Contact w/Disease

Contagious/infectious diseases

Fungi/molds

Fungi/Moulds

human waste

Insect bites & waste prod. (allergic reactions)

Rodents and waste by-products

Virus

virus/bacteria

viruses/bacteria

Physical Hazards for the Transportation Sector

04-May-94

Physical Hazards

Cold
Cold vehicles
Conjested Dock
Extreme temperatures
Fork Lifts
Heat
Lifting of Heavey Objects
noise
Noise - loose vehicle components
Non-ionizing radiation
Radiation
Radiation-sun
Radiation-welding
slippery floor
Steam
Steam (heat)
Steering
Temperature
Termperature
V.D.T
Vehicle Lifting
Vehicles
Vibration
Vibration - city roads, subway body sway

Safety Hazards for the Transportation Sector

04-May-94

Safety Hazards

Accidents
Battery acid
brake chambers
brake dust
burns
Burns to hands
Cluttered Walkways
concrete chipping
Confined Space
dusts
electrical
Eye injury
Falling
Foot injury
Fork Lift Drivers
fork lift operation
Forklift
Grinder dust
grinder guards
Grinding Wheel
Height of stored product
High Pressure
hoist failure
housekeeping
Housekeeping in garage
Hydraulic Jacks
hydraulic pressure
Improper Disposal of Solvent Soaked Rags
Improper Storage of Unused Paint
Improper Storage of Welding Cylinders
incinerator operation
inflating tires
Lifting
lifting devices
machinery, pulleys, gears, belts/couplers,fans
Manual Lifting
Material handling equipment

Safety Hazards

night driving
overhead crane
Passenger concerns
passenger: personal injury
personal injury
Picking Product from Racks
Poor Housekeeping
Potential for Violence
propane fires
Pushing Pallets you can't see over
Road Conditions
Roll over
rubber from tires
Safety Shoes
shovelling wet concrete out of a drum due to mech.
breakdown
slip and fall
Slipping
slips & falls
slips/falls
Smoking
Snow and ice
snow/ice
spring brake chambers
Stairs and ladders
Student behaviour
truck wash, hydrochloric acid
Uneven ground
various hazards
Vehicle Accidents
violence
welding
welding fumes
Wet floors
winter driving

Stress Hazards for the Transportation Sector

04-May-94

Stress Hazards

Driver shortage
Drivers
Driving conditions: night
Driving conditions: traffic
Driving conditions: weather
emergency response
Extra students
Hours
Hours of Work
Inclement weather
Interior noise
Job dissatisfaction
Job insecurity, changing resp., organizational change
Job Security
Lack of Cooperation
lack of supervision
Long hours tiredness
Management
Mechanical Breakdowns
Meeting Deadlines
Monotony
Occasional personality conflicts
Plant Dispatch Batching Office
Quota System
Repetitive
Repetitive duties
repetitive work
Repetitive work tasks
Rotating shifts
SalesPerson
scheduling (time)
School areas: no parking, but parents pick up child
Shifts
Shiftwork
split shifts
Student behaviour
Subway suicide

Stress Hazards

Vehicular traffic
Verbal abuse
Violence
Violence/theft
Violent students
working alone
Working with Public
Workload
Workplace violence

Work Design Hazards for the Transportation Sector

04-May-94

Work Design Hazards

Adjustability of seat
Air Quality
Assisting Disabled
CIS station design
Clerical - lifting vaults
Conveyor Take-up Pulley Steam Line
Cycloning
Designated Smoking Area
Diesel exhaust
Equipment design
Ergonomics
Exhaust emissions
falling
falling from dock plates
Fork Lift Operation
garage area
hoist
Layout/design
Lifting
Lifting/Material Handling
Lighting
Lighting, tripping, falling
Loading Heavy packages
Metal Roof
Not enough space
Order Selecting
Pit falls
Posture/reach
Racking
Re & Re Engines Transmissions, differentials, drum
Ready Mix Truck
Repetitive strain
Resetting of emergency valves
Restrains
sand blasting
seating

Work Design Hazards

Second hand cigarette smoke

Shelving

Steering

Truck Seats

Vehicle Layout

Vehicles & Maintenance

Vehicles/bus

Ventilation

Video display terminals

w/c restraints

Workstation

Workstation - steering, seat, accessibility of contr

MINISTRY OF TRANSPORTATION PUBLICATIONS

MINISTRY OF TRANSPORTATION PUBLICATIONS

Publications

1. Equipment Daily Inspections Book & Service Record
2. Equipment Manual
3. Maintenance Manual - Quality Standard, Volume 1
4. Maintenance Manual - Operation Instructions, Volume 4
5. Ontario Provincial Standards for Roads & Municipal Services
6. Ontario Provincial Standards - User's Guide
7. Roadside Safety Manual
8. Provincial Highway Class Assessment Parent Document

Acts Administered Wholly or in Part by Transport Canada

1. Bills of Lading
(R.S.C. 1985, C. B-5)
2. Motor Vehicle Fuel Consumption Standards Act
(R.S.C. 1985, C. M-10)
3. Motor Vehicle Safety Act
(R.S.C. 1985, C. M-10)
4. Motor Vehicle Tire Safety Act
(R.S.C. 1985, C. M-11)
5. Motor Vehicle Transport Act
(R.S.C. 1985, C. M-12.01)
6. Northern Transportation Company Ltd Disposal Authorization Act
(R.S.C. 1985, C. 35 and S.C. 1988, C. 38)

Act and Regulations Administered Wholly or in Part by the Ministry of Transportation

1. Highway Traffic Act (R.S.O. 1980, C. H-8)
 - Allowable Gross Weight for Designated Class of Vehicle Regulations 573
 - Commercial Motor Vehicle Inspections Regulations 575
 - Covering of Loads Regulation 577
 - Driver Improvement Regulation 582
 - Equipment Regulation 587
 - Garage Licences Regulation 595
 - Gross Vehicle Weight Regulation 597
 - Hours of Work Regulation 600
 - Notice to have Motor Vehicle(s) Examined and Tested Regulation 602
 - Restricted Use of Left Lanes by Commercial Motor Vehicles Regulation 618
 - Safety Inspection Regulation 611
 - School Buses Regulation 612
 - Security of Loads Regulation 614
 - Specifics and Standards for Trailer, Couplings Regulation 618
2. Public Vehicles Act (R.S.O. 1980, C. P-54)
 - General Regulations 982
3. Toronto Area Transit Operating Authority Act (R.S.O. 1980, C. T-13)
 - General Regulations 1036
4. Truck Transport Act (R.S.O. 1980, C. T-22)
 - Condition of Carriage - Animal Specialties Regulation 1086
 - General Freight Carriers Regulation 1087
 - Household Goods Carrier Regulation 1088
 - Intermediaries Regulation 1089
 - Obligations of Licensees Regulation 1090
 - Operating Licences Regulation 1091

FATALITY REPORTS

FATALITY REPORTS

We were able to analyze twenty-eight fatality reports from the 1988 to 1992 period. Included in the reports were details of the accident, cause(s) and coroner and jury recommendations for each fatality. We have provided a summary of these reports contained in appendices 3. Included in this summary are the available case reference numbers, the hazard(s) recognized during the investigation, training recommendations and the appropriate Transportation Sector, Workers' Compensation Board rate group number. It should be noted that training recommendations appeared on every report we were able to review. We were able to correlate the hazards and training recommendations in the report to the hazards we have recognized in this sector through survey and research data. This information has been used to objectively reinforce our case for recommendations on specific modules.

MOL/ISN No.	Hazard	Training	Rate Group
1. ISN 2108	Welding Tank in Truck Repair (explosion)	TDG & Testing Procedures Hazard Recognition	IAPA 570 *
2. ISN 1956	Unsecured Load of Steel Tubing	Load Security Hazard Recognition	IAPA 570 *
3. ISN 1832	Toluene Explosion	Training Procedures & Enforcement	IAPA 570 *
4. ISN 1711	Trapped Under Bale of Cardboard	Loading Procedures & Security	570
5. ISN 1662	Collision Bus & Tank Truck	Physical Effects Bulk Loads Inspections	570
6. ISN 1536	Hydraulic Hoist Separation (Dump Truck)	Hazard Awareness	IAPA 570 *
7. ISN 1283	Dump Truck Reversing	Hazard Awareness Procedures	IAPA *
8. ISN 571	Explosion & Fire Tank Truck	Loading Procedures Tank Design	IAPA 570 *
9. ISN 360	Truck Reversing	Procedures Hazard Awareness	IAPA 570 *
10. ISN 293	Exploding Container	WHMIS & Storage	570
11. ISN 121	Broken Air Line on Transmission	Driver Improvement Preventative Maintenance	IAPA 570 *

* Firm although involved in Transportation Sector Occupations were represented by the Industrial Accident Prevention Association.

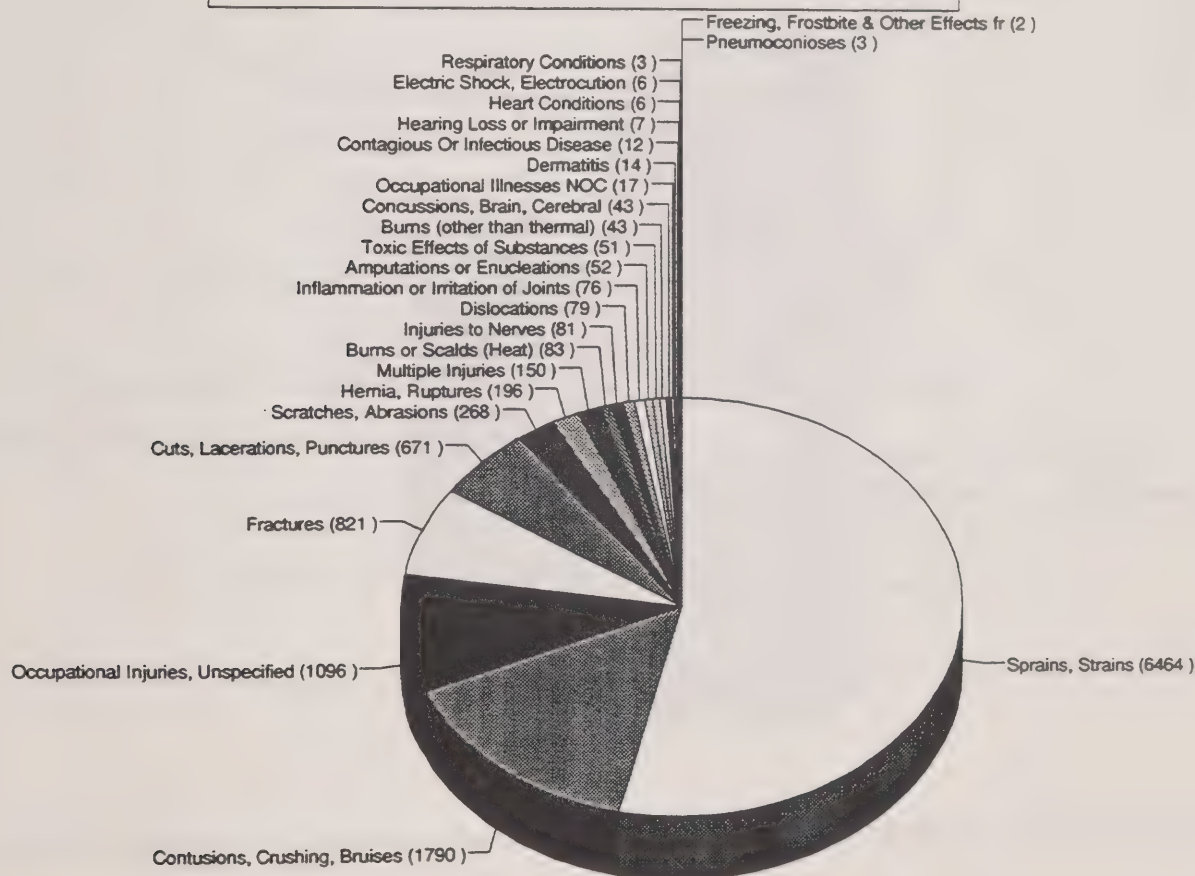
MOL/ISN No.	Hazard	Training	Rate Group
12. ISN 73	Motor Vehicle Accident	Air Brake Course Proper Inspection	570
13. MOL 14480	Worker Crushed (machinery)	Proper Procedures Hazard Recognition	689
14. Ottawa Jan 6, 1992	Cable Stretched Across Highway	Traffic Control Procedures PPE	689
15. MOL 14449	Worker Crushed at Loading Dock	Awareness OHSA Preventative Maintenance Inspections	560
16. Highway 17 Jun 24, 1991 Blind River	Insecure Load Coils of Steel	Load Security Equipment Inspection	570
17. MOL 14364	Lift of Limber Fell	Hazard Awareness Equipment Specifics	570
18. Windsor Feb 20, 1991	Fall from Tanker	Hazard Awareness Fall Protection	570
19. Brampton Jun 15, 1987	Cleaning Inside Ready-Mix Drum	Procedures Confined Space Entry	497
20. MOL 14269	Vehicle Overloaded	Procedures Hazard Awareness	570
21. MOL 14272	Truck Reversing at Loading Dock	Hazard Awareness Proper Equipment	570
22. MOL 14488	Heat Induced Malignant Hyperthermia	Awareness re: Heat Stroke	
23. MOL 14283	Air Brake Chamber Exploded	Hazard Awareness Preventative Maintenance	570
24. MOL 14262	Head Crushed between Two Vehicles	Hazard Awareness Procedures	570
25. MOL 14125	Reversing Vehicle at Loading Dock	Hazard Awareness Procedures	560
26. MOL 14108	Insecure Load PVC Sewer Pipe	Hazard Awareness Procedures	570
27. MOL 14258	Trailers Unhooked	Hazard Awareness Procedures	570
28. MOL 14617	Exploding Tubeless Tire During Weld Repair to Rim	Hazard Awareness Procedures	570

MINISTRY OF LABOUR WORKERS' COMPENSATION BOARD DATA

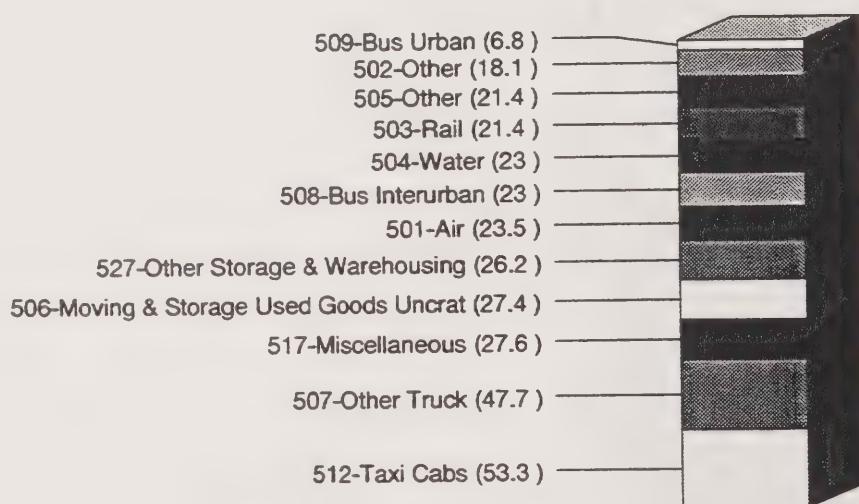
- Graph 1** - Claim Counts by Nature of Injury for 1990-92
- Graph 2** - Average Days Lost Per Injury for the Sector
- Graph 3** - Percentage of Lost Time Injuries for the Sector
- Graph 4** - Transportation Sector Injury Data - 1989
By Rate Group as per Dollar Cost to WCB

Graph 1

Transportation Sector Claim Counts by Nature of Injury for 1990-92



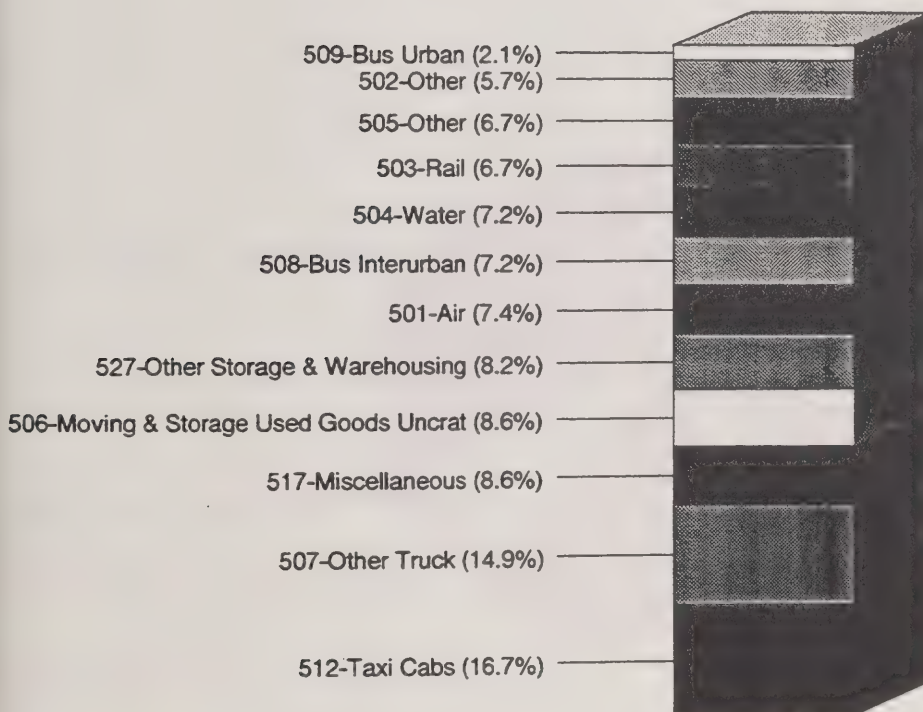
Average Days Lost Per Injury for the Sector



Injury data is based on WCB, Workplace Injury Retrieval System (WIRS) System 54.

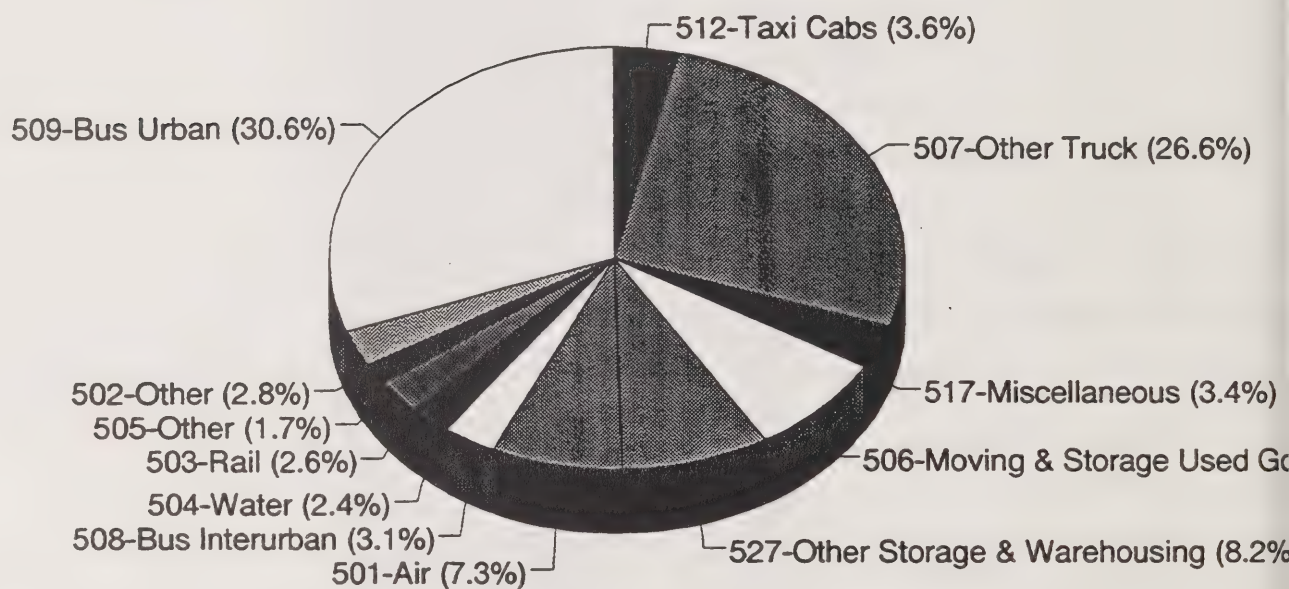
Graph 3

Percentage of Lost Time Injuries for the Sector



Injury data is based on WCB, Workplace Injury Retrieval System (WIRS) System 54, 1989

Transportation Sector Injury Data - 1989
By Rate Group as per Dollar Cost to WCB



INJURIES BY RATE, TYPE AND SOURCE, SUMMARY

- Rate Group: 553
- Rate Group: 560
- Rate Group: 570
- Rate Group: 581
- Rate Group: 586
- Rate Group: 681
- Rate Group: 689 (x 2)

INJURIES BY RATE, TYPE AND SOURCE, SUMMARY

Rate Group: 553

Rate	Number	Type	Source
553	015	Bump into Stationary Object	12
	023	Falling Object During Handling	4
	024	Falling Object, NEC	8
	026	Flying Object Thrown Back by Machine	
	027	Flying Object, NEC	3
	029	Struck By, NEC	17
	032	From Ladders	2
	035	From Stairs	6
	037	From Scaffolds, Stagings, etc.	
	038	From Walkways, Platforms, Ramps, etc.	1
	040	From Stationary Vehicles	6
	041	From Moving Vehicles	1
	042	Into Bins, Vats, Kilns, Tanks, etc.	1
	044	Into Vessel Holds, Manholes, Openings, NEC	1
	045	Things Not Intended to be Stood On	1
	049	Fall to Lower Level, NEC	5
	052	Fall Onto or Against Objects	
	053	Fall Due to Rough Surfaces, Trip, etc.	4
	054	Fall Due to Slippery Surface	7
	055	Fall Due to Slip While Handling Materials	3
	056	Fall to Walkway or Working Surface, NEC	5
	059	Fall on Same Level, NEC	1
	061	In Running or Meshing Objects	
	062	A Moving & A Stationary Object	
	069	Caught In, Under or Between, NEC	8
	081	By Lean, Kneel, Sit on Object (not vibrating)	1
	083	By Vibrating Objects	
	101	From Involuntary Motions	23
	102	From Voluntary Motions	5
	121	In Lifting Objects	18
	122	In Pulling or Pushing Objects	9
	123	In Welding or Throwing Objects	1
	129	Overexertion, NEC (including carrying)	32
	130	Contact with Electric Current	1
	153	Hot Objects or Substances	5
	182	By Ingestion	
	183	By Absorption	5
	185	By Inhalation, NEC	

INJURIES BY RATE, TYPE AND SOURCE, SUMMARY

Rate Group: 553

(cont'd)

Rate	Number	Type	Source
553	201	Aircraft Accident	4
	298	Public Vehicle Accident, NEC	
	311	With Oncoming Vehicle, Same Road, Street, Stairway	1
	318	Unspecified	
	338	Other Noncollision Accidents	
	400	Vehicle Accidents, NEC	
	420		1
	899	Accident Type, NEC	
	998		4
	999	Unclassified, Insufficient Data	4
		TOTAL	211

INJURIES BY RATE, TYPE AND SOURCE, SUMMARY

Rate Group: 560

Rate	Number	Type	Source
560	015	Bump into Stationary Object	11
	023	Falling Object During Handling	5
	024	Falling Object, NEC	8
	026	Flying Object Thrown Back by Machine	
	027	Flying Object, NEC	10
	029	Struck By, NEC	23
	032	From Ladders	2
	033	From Piled Materials	1
	037	From Scaffolds, Stagings, etc.	
	038	From Walkways, Platforms, Ramps, etc.	1
	040	From Stationary Vehicles	1
	041	From Moving Vehicles	1
	048	From Poles, Trees, Logs, Stumps	1
	049	Fall to Lower Level, NEC	6
	052	Fall Onto or Against Objects	2
	053	Fall Due to Rough Surfaces, Trip, etc.	3
	054	Fall Due to Slippery Surface	7
	055	Fall Due to Slip While Handling Materials	
	056	Fall to Walkway or Working Surface, NEC	3
	059	Fall on Same Level, NEC	
	061	In Running or Meshing Objects	
	062	A Moving & Stationary Object	
	069	Caught In, Under or Between, NEC	13
	101	From Involuntary Motions	26
	102	From Voluntary Motions	5
	121	In Lifting Objects	23
	122	In Pulling or Pushing Objects	6
	123	In Welding or Throwing Objects	
	129	Overexertion, NEC (including carrying)	42
	130	Contact with Electric Current	
	153	Hot Objects or Substances	5
	183	By Absorption	2
	311	With Oncoming Vehicle, Same Road, Street, Trafficway	
	312	With Vehicle Same Direction, Same Road, Street, Trafficway	1
	338	Other Noncollision Accidents	1
	400	Vehicle Accidents, NEC	
	410		1
	420		3
	431		1
	436		1
	439		1
	899	Accident Type, NEC	
	998		2
		TOTAL	217

INJURIES BY RATE, TYPE AND SOURCE, SUMMARY

Rate Group: 570

Rate	Number	Type	Source
570	013	Step on Stationary Object (including kick)	19
	015	Bump into Stationary Object	315
	023	Falling Object During Handling	180
	024	Falling Object, NEC	283
	025	Flying Object Due to Explosion	
	026	Flying Object Thrown Back by Machine	5
	027	Flying Object, NEC	99
	029	Struck By, NEC	511
	032	From Ladders	32
	033	From Piled Materials	1
	035	From Stairs	37
	037	From Scaffolds, Stagings, etc.	6
	038	From Walkways, Platforms, Ramps, etc.	20
	040	From Stationary Vehicles	387
	041	From Moving Vehicles	21
	042	Into Bins, Vats, Kilns, Tanks, etc.	
	044	Into Vessel Holds, Manholes, Openings, etc.	5
	045	Things Not Intended to be Stood On	13
	047	From Buildings, Roofs, Bridges (not in water)	4
	049	Fall to Lower Level, NEC	94
	052	Fall Onto or Against Objects	100
	053	Fall Due to Rough Surfaces, Trip, etc.	75
	054	Fall Due to Slippery Surface	286
	055	Fall Due to Slip While Handling Materials	87
	056	Fall to Walkway or Working Surface, NEC	66
	059	Fall on Same Level, NEC	40
	061	In Running or Meshing Objects	18
	062	A Moving & A Stationary Object	13
	069	Caught In, Under or Between, NEC	355
	081	By Lean, Kneel, Sit on Object (not vibrating)	3
	083	By Vibrating Objects	
	084	By Foreign Matter in Eyes	
	085	By Repetition of Pressure	1
	089	Rubbed or Abraded, NEC	1
	101	From Involuntary Motions	868
	102	From Voluntary Motions	183
	121	In Lifting Objects	629
	122	In Pulling or Pushing Objects	305
	123	In Welding or Throwing Objects	29
	129	Overexertion, NEC (including carrying)	1,336
	130	Contact with Electric Current	2

INJURIES BY RATE, TYPE AND SOURCE, SUMMARY

Rate Group: 570

(cont'd)

Rate	Number	Type	Source
570	152	General Cold-Atmos or Environment	3
	153	Hot Objects or Substances	27
	154	Cold Objects or Substances	
	183	By Absorption	38
	184	By Inhalation of Water (drowning)	
	185	By Inhalation, NEC	9
	189	NEC	1
	203	Bus Accident	
	298	Public Vehicle Accident, NEC	1
	311	With Oncoming Vehicle, Same Road, Station, Trafficway	9
	312	With Vehicle Same Direction, Same Road, Station, Trafficway	57
	313	With Vehicles in Intersecting Trafficway	12
	318	Unspecified	28
	321	Run Into/Sideswp Stand Vehicle in Roadway	4
	322	Run Into/Sideswp Stand Vehicle Roadside	13
	323	Struck by Another Vehicle While in Roadway	26
	324	Struck by Another Vehicle While Off Roadway	1
	328	Unspecified	5
	331	Overturned	57
	332	Ran Off Roadway (out of control)	33
	333	Sudden Stop or Start Injuring Occupant	8
	338	Other Noncollision Accidents	31
	400	Vehicle Accidents, NEC	
	410		2
	420		2
	431		3
	432		2
	433		1
	434		1
	435		10
	436		5
	439		1
	505		1
	600		2
	899	Accident Type, NEC	
	998		73
	999	Unclassified, Insufficient Data	5
		TOTAL	6,901

INJURIES BY RATE, TYPE AND SOURCE, SUMMARY

Rate Group: 581

Rate	Number	Type	Source
581	012	Struck Against Moving Object	
	013	Step on Stationary Object (including kick)	5
	015	Bump into Stationary Object	72
	023	Falling Object During Handling	48
	024	Falling Object, NEC	70
	025	Flying Object Due to Explosion	1
	026	Flying Object Thrown Back by Machine	3
	027	Flying Object, NEC	30
	029	Struck By, NEC	133
	032	From Ladders	16
	033	From Piled Material	1
	035	From Stairs	10
	037	From Scaffolds, Stagings, etc.	1
	038	From Walkways, Platforms, Ramps, etc.	4
	040	From Stationary Vehicles	73
	041	From Moving Vehicles	1
	042	Into Bins, Vats, Kilns, Tanks, etc	1
	043	Into Pits, Excavations, Shafts, etc.	1
	044	Into Vessel Holds, Manholes, Openings, NEC	3
	045	Things Not Intended to be Stood On	5
	047	From Buildings, Roofs, Bridges (not in water)	12
	049	Fall to Lower Level, NEC	24
	052	Fall Onto or Against Objects	17
	023	Falling Object During Handling	1
	024	Falling Object, NEC	3
	029	Struck By, NEC	3
	032	From Ladders	
	040	From Stationary Vehicles	
	049	Fall to Lower Level, NEC	1
	052	Fall Onto or Against Objects	
	053	Fall Due to Rough Surfaces, Tip, etc.	1
	054	Fall Due to Slippery Surface	
	055	Fall Due to Slip While Handling Materials	
	056	Fall to Walkway or Working Surface, NEC	1
	059	Fall on Same Level, NEC	
	069	Caught In, Under or Between NEC	1
	101	From Involuntary Motions	4
	121	In Lifting Objects	2
	122	In Pulling or Pushing Objects	2
	123	In Welding or Throwing Objects	1
	129	Overexertion, NEC (including carrying)	4
	183	By Absorption	2
	400	Vehicle Accidents, NEC	
	433		1
	899	Accident Type, NEC	
		TOTAL	27

INJURIES BY RATE, TYPE AND SOURCE, SUMMARY

Rate Group: 586

Rate	Number	Type	Source
586	013	Step on Stationary Object (including kick)	
	015	Bump into Stationary Object	36
	023	Falling Object During Handling	8
	024	Falling Object, NEC	4
	027	Flying Object, NEC	12
	029	Struck By, NEC	54
	032	From Ladders	5
	033	From Piled Materials	1
	035	From Stairs	10
	038	From Walkways, Platforms, Ramps, etc.	1
	040	From Stationary Vehicles	30
	043	Into Pits, Excavations, Shafts, etc.	1
	044	Into Vessel Holds, Manholes, Openings, NEC	
	045	Things Not Intended to be Stood On	1
	049	Fall to Lower Level, NEC	2
	052	Fall Onto or Against Objects	9
	053	Fall Due to Rough Surfaces, Trip, etc.	13
	054	Fall Due to Slippery Surface	44
	055	Fall Due to Slip While Handling Materials	5
	056	Fall to Walkway or Working Surface, NEC	11
	059	Fall on Same Level, NEC	
	062	A Moving & A Stationary Object	
	069	Caught In, Under or Between, NEC	18
	081	By Lean, Kneel, Sit on Object (not vibrating)	
	083	By Vibrating Objects	
	085	By Repetition of Pressure	
	089	Rubbed or Abraded, NEC	
	101	From Involuntary Motions	109
	102	From Voluntary Motions	33
	121	In Lifting Objects	74
	122	In Pulling or Pushing Objects	37
	123	In Welding or Throwing Objects	2
	129	Overexertion, NEC (including carrying)	208
	151	General Heat-Atmos or Environment	
	153	Hot Objects or Substances	3
	183	By Absorption	5
	185	By Inhalation, NEC	4
	189	NEC	1

INJURIES BY RATE, TYPE AND SOURCE, SUMMARY

Rate Group: 586

(cont'd)

Rate	Number	Type	Source
586	203	Bus Accident	19
	209	Taxi Accident	2
	298	Public Vehicle Accident, NEC	1
	311	With Oncoming Vehicle, Same Road, Street, Trafficway	2
	312	With Vehicle Same Direction, Same Road, Street, Trafficway	28
	313	With Vehicle in Intersecting Trafficway	11
	318	Unspecified	4
	321	Run Inot/Sideswp Stand Vehicle in Roadway	2
	322	Run Into/Sideswp Stand Vehicle Roadside	3
	323	Struck by Another Vehicle While in Roadway	9
	324	Struck by Another Vehicle While Off Roadway	1
	328	Unspecified	4
	331	Overtured	2
	332	Ran Off Roadway (out of control)	5
	333	Sudden Top or Start Injuring Occupant	6
	338	Other Noncollision Accidents	18
	436		3
	899	Accident Type, NEC	
	998		5
	999	Unclassified, Insufficient Data	2
		TOTAL	868

INJURIES BY RATE, TYPE AND SOURCE, SUMMARY

Rate Group: 681

Rate	Number	Type	Source
681	053	Fall Due to Rough Surfaces, Trip, etc.	16
	054	Fall Due to Slippery Surface	47
	055	Fall Due to Slip While Handling Materials	16
	056	Fall to Walkway or Working Surface, NEC	11
	059	Fall on Same Level, NEC	7
	061	In Running or Meshing Objects	15
	062	A Moving & A Stationary Object	7
	069	Caught In, Under or Between, NEC	84
	081	Be Lean, Kneel, Sit on Object (not vibrating)	2
	083	By Vibrating Objects	
	089	Rubbed or Abraded, NEC	
	101	From Involuntary Motions	155
	102	From Voluntary Motions	38
	121	In Lifting Objects	143
	122	In Pulling or Pushing Objects	46
	123	In Welding or throwing Objects	6
	129	Overexertion, NEC (including carrying)	292
	130	Contact with Electric Current	2
	151	General Heat-Atmos or Environment	
	153	Hot Objects or Substances	8
	183	By Absorption	11
	185	By Inhalation, NEC	3
	311	With Oncoming Vehicle, Same Road, Street, Trafficway	1
	312	With Vehicle Same Direction, Same Road, Street, Trafficway	4
	318	Unspecified	2
	321	Run Into/Sideswp Stand Vehicle in Roadway	1
	322	Run Into/Sideswp Stand Vehicle Roadside	
	323	Struck by Another Vehicle While in Roadway	1
	331	Overtaken	6
	332	Ran Off Roadway (out of control)	
	333	Sudden Stop or Start Injuring Occupant	2
	338	Other Noncollision Accidents	8
	400	Vehicle Accidents, NEC	
	410		1
	431		1
	436		3
	439		2
	502		1
	505		3
	899	Accident Type, NEC	
	998		19
	999	Unclassified, Insufficient Data	
		TOTAL	1,487

INJURIES BY RATE, TYPE AND SOURCE, SUMMARY

Rate Group: 689

Rate	Number	Type	Source
689	013	Step on Stationary Object (including kick)	6
	015	Bump into Stationary Object	14
	023	Falling Object During Handling	8
	024	Falling Object, NEC	20
	025	Flying Object Due to Explosion	
	026	Flying Object Thrown Back by Machine	1
	027	Flying Object, NEC	12
	029	Struck By, NEC	40
	032	From Ladders	5
	035	From Stairs	
	040	From Stationary Vehicles	6
	045	Things Not Intended to be Stood On	2
	049	Fall to Lower Level, NEC	2
	052	Fall Onto or Against Objects	7
	053	Fall Due to Rough Surfaces, Trip, etc.	3
	054	Fall Due to Slippery Surface	13
	055	Fall Due to Slip While Handling Materials	3
	056	Fall to Walkway or Working Surface, NEC	
	059	Fall on Same Level, NEC	
	061	In Running or Meshing Objects	4
	062	A Moving & A Stationary Object	
	069	Caught In, Under or Between, NEC	13
	083	By Vibrating Objects	
	101	From Voluntary Motions	14
	102	From Voluntary Motions	4
	121	In Lifting Objects	13
	122	In Pulling or Pushing Objects	5
	123	In Welding or Throwing Objects	1
	129	Overexertion, NEC (including carrying)	35
	130	Contact with Electric Current	
	153	Hot Objects or Substances	13
	183	By Absorption	4
	185	By Inhalation, NEC	4
	331	Overtumed	1
	333	Sudden Stop or Start Injuring Occupant	1
	400	Vehicle Accidents, NEC	
	436		1
	505		1
	899	Accident Type, NEC	
	998		2
	999	Unclassified, Insufficient Data	
		TOTAL	258

INJURIES BY RATE, TYPE AND SOURCE, SUMMARY

Rate Group: 689

Rate	Number	Type	Source
689	015	Bump into Stationary Object	2
	023	Falling Object During Handling	
	024	Falling Object, NEC	2
	027	Flying Object, NEC	2
	029	Struck By, NEC	4
	035	From Stairs	
	040	From Stationary Vehicles	1
	049	Fall to Lower Level, NEC	
	056	Fall to Walkway or Working Surface, NEC	
	059	Fall on Same Level, NEC	2
	061	In Running or Meshing Objects	2
	069	Caught In, Under or Between, NEC	1
	081	By Lean, Kneel, Sit on Object (not vibrating)	
	101	From Involuntary Motions	3
	102	From Voluntary Motions	1
	121	In Lifting Objects	1
	122	In Pulling or Pushing Objects	1
	129	Overexertion, NEC (including carrying)	8
	183	By Absorption	
	321	Run Into/Sideswp Stand Vehicle in Roadway	1
	400	Vehicle Accidents, NEC	
	899	Accident type, NEC	1
	998		
		TOTAL	32

FINAL TOTAL

10,001

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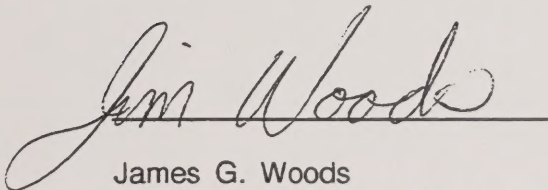
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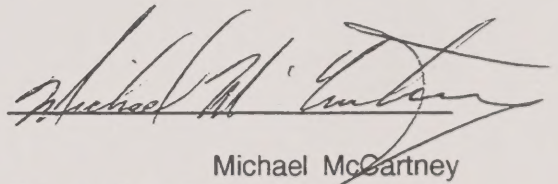
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The Coordinators recognize and appreciate ongoing input for the development of Certification Specific modules. To that end, the process of adding relevant, mutually agreed upon information can continue even after the report has been submitted to the Agency.

This report is respectfully submitted by:



James G. Woods
Sector Coordinator (Labour)



Michael McCartney
Sector Coordinator (Management)

Date: May 6th, 1994.

Received on behalf on the WHSA:

Doug Tobin
Certification Director (Labour)

A. Michael Holmes
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Date: _____

